PORT ARTHUR LNG LIQUEFACTION PROJECT

DRAFT RESOURCE REPORT NO. 2

WATER USE AND QUALITY

PUBLIC

Submitted by:

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PORT ARTHUR LNG LIQUEFACTION PROJECT

Draft Resource Report 2 – Water Use and Quality

To Verify Compliance with this Minimum FERC Filing Requirement:	See the Following Resource Report Section:
Identify/describe by milepost; perennial waterbodies, municipal water supplies, watershed areas, specially designed surface water protection areas, sensitive waterbodies, and wetlands that would be crossed. For each waterbody crossing, identify the approximate width, state water quality classifications, any known potential pollutants present in water or sediments, and any potable water intake sources within 3 miles downstream.	Section 2.1.1 Section 2.1.2 Section 2.2.1 Table 2.2-1
Compare proposed mitigation measures with the staff's current "Wetland and Waterbody Construction and Mitigation Procedures." Describe what proposed alternative mitigation would provide equivalent or greater protection to the environment, and provide a description of site-specific construction techniques to be used at each major waterbody crossing.	Section 2.5.1 Section 2.5.2
Describe typical staging area requirements at waterbody/wetland crossings. Also, identify and describe waterbodies and wetlands where staging areas are likely to be more extensive.	Section 2.5.1 Section 2.5.2
Provide National Wetland Inventory (NWI) maps.	Figure 2.2-2
Identify aquifers within excavation depth in project area, including depth of aquifer, current and projected use, water quality and average yield, and known or suspected contamination problems.	Section 2.4.1 Section 2.4.2 Section 2.4.3
Describe specific locations, quantity required, and the method and rate of withdrawal and discharge of hydrostatic test water. Describe suspended or dissolved material likely to be present in the water as result of contact with pipeline. Describe chemical and physical treatment of pipeline or hydrostatic test water. Discuss waste products generated and disposal methods.	Section 2.3 Section 2.5.4
Determine how water disposal will be handled if underground and/or salt cavern natural gas storage is proposed. (N/A)	No Storage Proposed
Provide proposed mitigation measures to reduce the potential for adverse impacts to surface water, wetlands, or groundwater quality. Discuss potential for blasting to affect water wells, springs, wetlands, and measures to be taken to detect/remedy such effects.	Section 2.5.1 Section 2.5.3 Section 2.5.2
Identify locations of known public and private groundwater supply wells/springs within 150 feet of proposed construction area. Identify locations of EPA or state-designated sole-source aquifers and wellhead protection areas crossed by the proposed pipeline facilities.	Section 2.4.1 Section 2.4.2 Section 2.4.3

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ACRONYMS AND ABBREVIATIONS

Commission	Federal Energy Regulatory Commission
EFH	Essential Fish Habitat
EPA	United States Environmental Protection Agency
ESCP	Erosion and Sedimentation Control Plan
FERC	Federal Energy Regulatory Commission
LNG	Liquefied Natural Gas
mg/kg	milligram per kilogram
MP	Milepost
MTPA	million tonnes per annum
MW	Megawatt
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetlands Inventory
PALNG	Port Arthur LNG, LLC
PAPL	Port Arthur Pipeline, LLC
PCBs	Polychlorinated Biphenyls
Plan	FERC's Upland Erosion Control, Revegetation and Maintenance Plan
Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
Q1	First Quarter (January – March)
Q3	Third Quarter (July – August)
ROW	Right-of-Way
SH	State Highway
SNWW	Sabine-Neches Waterway
SPCC	Spill Prevention, Control and Countermeasure Plan
TAC	Texas Administrative Code
TBS	T Baker Smith
TCEQ	Texas Commission for Environmental Quality
TPWD	Texas Parks and Wildlife Department
TSHS	Texas Department of State Health Services
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	Volt
Version 2.0	USACE 2010 Atlantic and Gulf Coastal Plains Regional Supplement
µg/L	micrograms per Liter

DRAFT RESOURCE REPORT 2
WATER USE AND QUALITY

2. INTRODUCTION

Port Arthur LNG, LLC (PALNG), an affiliate of Sempra LNG has prepared this application, which includes Resource Reports 1 through 13, in compliance with the requirements of the Federal Energy Regulatory Commission's (FERC's or Commission's) regulations for authorization to site, construct, and operate natural gas liquefaction facilities and a liquefied natural gas (LNG) export terminal under Section 3 (a) of the Natural Gas Act. The construction and operation of these facilities is collectively referred to as the "Port Arthur Liquefaction Project" or "Project." Port Arthur Pipeline, LLC (PAPL), an affiliate of Sempra US Gas & Power, is filing a complementary application in compliance with Section 7(c) that will address the feed gas supply pipeline to the Project.

PALNG proposes to use a portion of the approximately 2,900 acres of property owned by its affiliate Port Arthur LNG Holdings, LLC to site, construct, and operate the Port Arthur Liquefaction Project. The Project site is located approximately five miles south of the intersection of State Highway (SH) 87 and SH 82 near the City of Port Arthur, Texas, south of the Gulf Intracoastal Waterway and along the western side of the Port Arthur Ship Canal, which is part of the Sabine-Neches Waterway system. The Project would be located on substantially the same site that was previously evaluated and approved by the Commission and other agencies in 2006 as an LNG import terminal in an order issued under Docket No. CP05-83. The import terminal was never built. Natural gas will be delivered to the Project through proposed new pipeline facilities being developed by PAPL. The natural gas delivered to the Project will be cooled into a cryogenic liquid form via two liquefaction trains and stored in three 160,000-cubic meter full containment LNG storage tanks. The maximum proposed production capacity of the liquefaction process will be approximately 10 million tonnes per annum (MTPA) or 5 MTPA per train. A marine facility capable of berthing two LNG vessels will be constructed to transfer LNG onto ships.

The Project's purpose is to help satisfy the strong global market demand for liquefaction and export of domestic natural gas. In addition, the Project will offer other domestic benefits including substantial positive impacts on the national, regional, and local economies, and improvement in the United States balance of trade. In addition, the Project would significantly enhance the anticipated reductions in global emissions of greenhouse gases that are expected to result from the export of LNG from the United States to foreign markets, by providing consuming nations with access to lower carbon dioxide (CO_2)-emitting natural gas as an alternative to higher CO_2-emitting fossil fuels such as coal and fuel oil.

This Resource Report describes the existing surface water, wetlands, and groundwater resources in the vicinity of the Project and assesses the potential impacts to these resources resulting from the construction and operation of the LNG terminal including the highway/utility corridor relocation.

This report is organized into five major sections and a reference section. Sections 2.1, 2.2, 2.3 and 2.4 address surface water, wetlands, hydrostatic testing, and groundwater resources respectively for the Project. Section 2.5 presents the potential environmental consequences due to the construction and operation of the LNG Liquefaction Project. In addition, Sections 2.6

mentions the other jurisdictional facility associated with the project, the feed-gas pipeline, Section 2.7 discusses the above issues for the two non-jurisdictional facilities, and Section 2.8 discusses potential cumulative impacts from the project. Finally, Section 2.9 presents references used in the development of this Resource Report.

The resource reports are consistent with and meet all of the requirements of the Commission. The Commission's approval and issuance of authorization for construction of the Project by Q1 2017 will be needed to allow for the startup and operations of the first liquefaction train in Q1 2021 and the ultimate completion of the Project in the Q3 2021.

Agency Communications

In preparing this report, agency communications included: the Texas Commission for Environmental Quality (TCEQ), Railroad Commission of Texas, United States Geological Survey (USGS), United States Environmental Protection Agency (EPA), United States Army Corps of Engineers (USACE), and Texas Parks and Wildlife Department (TPWD). Copies of correspondence with these agencies are provided in Appendix 2.A.

2.1 SURFACE WATER

The Project will be constructed on an approximately 2,900 acre site that is bordered on the east by the Port Arthur Ship Canal, and on the west by a canal which drains into the Keith Lake Cut at the intersection with Keith Lake. The Port Arthur Ship Canal will provide access to the ship loading berths.

The Project site, the Port Arthur Canal, the SNWW**,** and the tributaries that flow into the SNWW are a portion of the USGS-designated watershed, Sabine Lake (USGS Cataloging Unit: 12040201); the watershed covers an area of 1,040 square miles in Texas and Louisiana. This watershed is a portion of the larger Galveston Bay-Sabine Lake Unit (USGS Accounting Unit 120402) in Louisiana and Texas, which covers an area of approximately 4,000 square miles and consists of the coastal drainage and associated waters from and including Sabine Pass to the Brazos River Basin boundary, but excluding the Neches and Sabine River Basins above the Sabine Lake, the Trinity River Basin above Trinity Bay, and the San Jacinto River above Galveston Bay (USGS 2004).

2.1.1 Site Waterbodies

The primary perennial surface waterbody associated with the Project is the Port Arthur Ship Canal segment of the SNWW. The Port Arthur Ship Canal forms the eastern boundary of the Project site, while a small, manmade canal, 1.7 miles in length, draining to the Keith Lake Cut at the intersection with Keith Lake forms the western boundary; no impacts are expected to this water feature from construction activities. Keith Lake is located approximately 1.5 miles to the south of the site and is considered an Ecologically Significant Stream by TPWD for its association with Salt Bayou and as a riparian conservation area. The Intracoastal Waterway is located directly north of the project property boundary; impacts are not anticipated associated with construction and operation of the project. Round Lake, while not part of the Project, is directly adjacent to the northern boundary of the terminal site and is hydrologically connected to Lost Lake and Keith Lake by two man-made canals on the southern and western boundaries of the Project site. Sabine Lake, located to the east of the Port Arthur Ship Canal is approximately 0.85 miles from the site at its closest point. Other than the Port Arthur Ship Canal and the two

man-made canals connecting Lost Lake and Keith Lake, there are no other on-site surface waterbodies that will be affected by the construction of the Project.

Sabine Lake is an inland estuary bisected by the Texas-Louisiana border near Orange and Port Arthur, Texas. The Neches River discharges into the northwest corner of Sabine Lake and the Sabine River discharges into the northeast corner. The SNWW is a 75-mile-long, deep-draft navigation channel which services the Ports of Port Arthur, Beaumont, and Orange. The SNWW lies on the western side of Sabine Lake and forms a deepwater channel between the Sabine and Neches Rivers and the Gulf of Mexico. The SNWW is dredged to approximately 40 feet and separated from Sabine Lake by Pleasure Island (Sabine Neches Navigation District 2015). The SNWW is approximately 0.23-miles-wide adjacent to the Project site.

2.1.2 Surface Water Classification

TCEQ establishes surface water quality standards to maintain the quality of water in Texas, consistent with public health and enjoyment, protection of aquatic life, and operation of existing industries and economic development of Texas, as well as to encourage and promote development and use of regional and area-wide wastewater collection, treatment, and disposal systems. TCEQ's water quality standards are based on the designated use for the surface water segment, and the criteria necessary to attain and maintain that use. These water quality standards define the goals for a body of water. The uses prescribe the purposes for which the water should be fit to use (e.g., recreation, support of aquatic life, drinking water supply). The criteria define the in-stream conditions necessary to support those uses (TCEQ 2014a).

The SNWW between the northern portion of Sabine Lake to the confluence with Sabine Pass, south of Pleasure Island, has been designated by TCEQ as the "Sabine-Neches Canal Tidal," Segment 0703. This waterbody is tidally influenced and estuarine. The Sabine-Neches Canal Tidal waterbody is classified in the Texas Administrative Code (TAC) Surface Water Quality Standards (30 TAC Chapter 307) for high aquatic life use, contact recreation use, general use, and fish consumption. The aquatic life, contact recreation and general uses are listed as fully supported, while fish consumption is cautioned due to elevated levels of polychlorinated biphenyls (PCBs) (TCEQ 2014, TSHS Adv-46, 2011). Water quality standards set by the TCEQ for this segment are summarized in Table 2.1-1. No potable water sources are located downstream from the Project site (TCEQ 2014).

2.1.3 Waterbodies with Contaminated Sediments

The Project will involve dredging in the Port Arthur Ship Canal. This waterbody is not listed in the Texas 2012 303(d) list of impaired waters. PALNG will conduct construction activities in accordance with FERC's Upland Erosion Control, Revegetation and Maintenance Plan (Plan) and FERC's Wetland and Waterbody Construction and Mitigation Procedures (Procedures) to minimize impacts. A site-specific Storm Water Pollution Prevention Plan will also be implemented and is a component of the Environmental Plan found in Resource Report 1, Appendix [1.B].

A site reconnaissance was conducted in May 2015 to identify environmental conditions of concern and conditions that would indicate contamination of the Project site. The recent and prior site reconnaissance visits revealed evidence of prior oil and gas exploration and transmission activities at the Project site, as well as prior dredged material disposal activities. As a result of the prior activities, soil and sediment samples were collected in 2004 as part of the initial planning to determine if the material to be dredged as part of the Project could be

used for beneficial reuse projects. In this initial sampling, individual soil samples were collected from specific locations at three different depths throughout the site (Appendix 2.B). The results of the sampling and analyses are summarized in Table 2.1-2. The results of the soil analyses were composited to reflect the mixing of the soils that will occur during the hydraulic dredging and placement in the dredged material disposal area, prior to being made available for beneficial reuse. Due to no site changes and ecological soil sampling, the review of soil conditions in 2015 confirmed the prior 2004 results.

The initial analyses indicate that the material is suitable for beneficial reuse projects. PALNG will conduct any additional testing required by the regulatory permitting authorities as well as the recipient of the material.

Laboratory toxicity tests were performed as indicators of potential eco-toxicological effects in sediments from Sabine Lake milepost (MP 2.0) and connecting waterways (Long 1999). The overall survey encompassed an area of approximately 246 kilometers (km) and included analyses of 66 sediment samples from Sabine Lake, the Neches and Sabine Rivers, the Gulf Intracoastal Waterway, and the entrance channel (Sabine Pass) to the Gulf of Mexico. Toxicity was determined with a battery of acute and sub-lethal tests conducted on bulk (solid-phase) sediments, pore waters, and organic solvent extracts in order to determine the concentrations of many potentially toxic substances, including ammonia, trace metals, polynuclear aromatic hydrocarbons, and chlorinated organic compounds. The study found that sediments in Sabine Lake and the vicinity did not appear to be severely degraded (Long 1999). Chemical concentrations rarely exceeded effects-based numerical guidelines, suggesting that toxicant-induced effects would not be expected in most areas. None of the samples was highly toxic in acute amphipod survival tests and a minority of samples was highly toxic in sub-lethal urchin fertilization tests. Sediments in the waterway channels were more contaminated than sediment from the Sabine Lake basin (Long 1999). Trace metals concentrations in sediments in the Sabine-Neches estuary have been reported as relatively low as compared to other estuaries along the Gulf Coast (Ravichandran *et al*, 1995).

2.2 WETLANDS

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (USACE 1987). PALNG used the 1987 USACE Wetland Delineation Manual in conjunction with the 2010 Atlantic and Gulf Coastal Plains Regional Supplement (Version 2.0) to identify and delineate wetlands occurring on the Project site (Figure 2.2-1).

Historical records indicate that the majority of the lands within the above-described boundaries were utilized for the disposal of dredge materials by the USACE, the Jefferson County Navigation District, and the Beaumont Navigation District. Use of the North Tract (defined as the section of the corridor to the north of the east-west oil-field access road which is adjacent to the south side of Round Lake) for dredge disposal occurred between 1982 and 1987. Use of portions of the South Tract for dredge disposal occurred between 1960 and 1963, and other portions from 1957 to 1980.

Resulting from this historic use, a system of levees varying from four to 16 feet above normal grade exists along the entire perimeter of the North Tract and along the north, west, and east

perimeters of the South Tract. Interior levees were constructed within the South Tract near Keith Lake Cut and both tracts contain a levee that bisects the property north to south.

The location of the Project site was selected on a number of factors including, 1) avoiding unique wetland types, such as that which occurs adjacent to Round Lake and the J.D. Murphree Wildlife Management Area; 2) providing sufficient area for the size and required orientation of the slip relative to the Port Arthur Ship Canal; 3) meeting the spacing requirements between facilities within the Project site; 4) providing adequate space for the relocation of SH 87 in compliance with Texas Department of Transportation (TXDOT) requirements; and 5) remaining within the property owned by Port Arthur LNG Holdings, LLC, an affiliate of PALNG. The historical use of this property for dredged material disposal which resulted in the development of wetlands of relatively poor functional value, facilitated selecting TWS location.

Tallow tree (*Triadica sebifera*), an exotic invasive plant species, was found to have established dominance over large portions of the Project site. Stem density and shading by the plant is altering the vegetation complex such that native plant species are completely absent in many locations on the property complicating the wetland vegetation criteria determination.

PALNG's wetland consultant, T. Baker Smith (TBS), reviewed the property characteristics and concluded that determinations of wetland versus non-wetland should be based upon the delineation method described in the Version 2.0 which includes occurrence of facultative wetland plant species in combination with positive indicators of hydrology and soil characteristics of a wetland. Vegetative indicator status for plants found onsite was determined by consulting the March 2014 National Wetland Plant List and soils data were obtained from the *Soil Survey of Jefferson County, Texas*.

2.2.1 Emergent Wetlands

Emergent wetlands in Palustrine and Estuarine ecosystems occur throughout large portions of the property. The eastern boundary of the property between the east levee and SH 87 is irregular tidal marshland dominated by palustrine species Common Reed *Phragmites australis,* Tievine *Ipomoea cordatotriloba,* Seaside Club-Rush (*Schoenoplectus robustus),* California Club Rush (*Schoenoplectus californicus),* Bushy Seaside-Tansy (*Borrichia frutescens),* Salt-Meadow Cord Grass (*Spartina patens),* Broad-Leaf Cat-Tail (*Typha latifolia),* Annual Marsh-Elder (*Iva annua),* Brown-Seed Crown Grass (*Paspalum plicatulum),* Trumpet-Creeper (*Campsis radicans),* Mexican Palo-Verde (*Parkinsonia,)* Chinese Tallow (*Triadica sebiferum),* Sugar-Berry (*Celtis leavigat),* and Groundsel tree (*Baccharis halimifolia)*.

Emergent estuarine wetlands occurring within the northern property tract are non-tidal, vegetated by Coastal Salt Grass (*Distichlis spicata*), Seaside Club-Rush, California Club Rush, Salt-Meadow Cord Grass, Broad-Leaf Cat-Tail, and Jesuit's Bark (*Iva frutescens*).

2.2.2 Scrub-Shrub Wetlands

Areas meeting the criteria of scrub-shrub wetlands occur extensively throughout both the north and south tracts of the property (Figure 2.1-1). Marsh elder (*Iva frutescens*), sugar-berry (*Celtis laevigata)*, and tallow are the commonly occurring shrub species within these wetlands, but wax myrtle (*Morella cerifera*) and Baccharis (*Baccharis halimifolia*) occur irregularly in association with these species. Emergent wetland species intermingle within these habitats as well. The tallow wetlands were observed along drainages that transport storm water runoff throughout the property.

2.2.3 Forested Wetlands

In the original 2004 wetland delineation, forested wetlands were the most common wetland type observed within the Project site boundaries but the least common type within the overall Project area. All areas observed meeting the criteria of forested wetlands contained a vegetative complex dominated exclusively by either pure stands of mature black willow or tallow tree, adjoining scrub-shrub wetlands containing juvenile specimens of these same species, or containing intermixed stands of mature and scrub-shrub individuals of both species. However, a more recent onsite investigation to confirm presence of wetlands revealed that the forested wetlands have been replaced by tallow-dominated scrub-shrub wetlands.

The tallow tree is an invasive, noxious plant species described by the United States Department of Agriculture (USDA) as a species that "causes large-scale ecosystem modification throughout the southeastern U.S. by replacing native vegetation". In the areas of the Project site containing tallow groves, vegetation species diversity is limited due to the tallow's ability to out-compete and shade out other plant species resulting in near homogenous stands of this species.

Based upon the negative effects of this species on the ecosystem, it appears that the forested wetland areas within the project site dominated by this species be assigned lower functional values as other native forested wetland habitats. Because the tallow wetlands could pose a threat to adjacent natural wetland habitats, these tallow wetlands would be assigned a negative functional value.

2.2.4 NWI Designated Wetlands

United States Fish and Wildlife (USFWS) National Wetlands Inventory (NWI) maps were also consulted to identify the potential occurrence of wetlands within the Project site and compared with results of the field surveys. Based on the information presented on the NWI maps (Figure 2.2-2), the majority of the Project site contains wetlands of the following types:

- PEM1Khs - Palustrine Emergent, Persistent, Artificial, diked, spoil;
- PEM1A - Palustrine Emergent, Persistent, Temporary;
- PSS1Ahs - Palustrine Scrub-shrub, Persistent, diked, spoil; and
- E2SS3P - Estuarine Intertidal, Scrub-shrub, Broad-leaved Evergreen, Irregular.

The NWI designations are consistent with the findings of the field delineation.

2.2.5 Essential Fish Habitat Wetlands

Essential Fish Habitat (EFH) wetlands were defined as those coastal marshes that are tidally influenced areas (or are associated with waterbodies with tidal influence). There are no

wetlands meeting this definition on the Project site or the dredged material disposal area. PALNG used field surveys to identify wetland types and the potential for tidal influence on the site.

2.2.6 Wetland Areas Affected

Development of the administration area, LNG train area, LNG storage tank area, LNG loading slip and berths, and self-generation area will encompass approximately XXX acres. Impacts from temporary construction areas include approximately XXX acres. Approximately XXX acres of wetland habitats impacted by development of the Project facilities include:

- Spartina / Typha (E2EMKhs) - XXX acres;
- Phragmites / Schoenoplectus / Baccharis (PEM) - XXX acres; and
- Tallow / Typha / Morella (PSS1Ahs) - XXX acres.

Development of the dredged material disposal area will encompass approximately XXX acres of which XXX acres are poor quality emergent wetlands classified as Palustrine, Emergent, Persistent, artificial, diked, spoil (PEM1Khs).

There are no EFH wetlands associated with the Project site.

2.3 HYDROSTATIC TESTING

The inner container of the LNG storage tanks will be hydrostatically tested. It is proposed that the hydrotest water will be obtained from the nearby City of Port Arthur water line or from river water purchased from the Lower Neches River Authority and transported to the terminal in barges. The water will be pumped from the extraction point using either electric or engine driven pumps suitably sized to achieve the required transfer rate. Floating suction hoses with strainers attached will be deployed to avoid entrainment or impingement of marine organisms and to prevent drawing in unnecessary solids and silts from the riverbed.

In advance of filling the tanks, the hydrotest water source will be tested to ensure that the water will meet all applicable testing code requirements. To minimize water usage, the three tanks will be hydrotested with the same water by transferring the water at the conclusion of the hydrotesting of one tank to the next tank to be hydrotested. The duration that the water remains in the tanks will be strictly controlled, therefore it is not envisaged that any contamination or discoloration will be present on discharge. The water will be discharged to meet water quality permit criteria.

The quantity of water required for hydrotesting one tank is estimated to be approximately 29 million gallons. Therefore, the total required volume of hydrotest water is estimated to be 87 million gallons. The total duration of each hydrotest from start of filling to emptying is expected to be approximately three weeks per tank.

The rate of discharge is expected to be approximately 1,800,000 U.S. gallons per 24 hours for the bulk pumping operation with substantially lower rates being achieved when removing the final amounts of water from the tank bottom. The hydrotest water will be discharged to the Port Arthur Ship Canal or J.D. Murphree Wildlife Management Area, if requested by Texas Parks and Wildlife Department, who had previously indicated that they would be receptive to a quantity of fresh water to help reduce the amount of salt water that is presently resulting in the

degradation of the marsh. Discussions are ongoing as to the need and recommended discharge location of this water. Water will be sampled and tested for suitability prior to discharge. If treatment is found to be required, treatment procedures will be developed prior to discharge.

2.4 GROUNDWATER RESOURCES

The Texas Water Development Board (TWDB) defines major aquifers as those aquifers supplying large quantities of water in large areas of Texas, and minor aquifers as those aquifers supplying either large quantities of water in small areas or relatively small quantities in large areas (TWDB 2012). No major or minor TWDB-defined aquifers are present at the Project site, although the Gulf Coast Aquifer is a TWDB-defined major aquifer that is approximately 10 miles to the west of the Project site.

The Gulf Coast Aquifer consists of three individual aquifers (TWDB 2011). From shallowest to deepest, the Chicot, Evangeline, and Jasper aquifers consist of interbedded clays, silts, sands, and gravels, which are hydrologically connected to form the entire aquifer system. The Chicot and Evangeline Aquifers underlie the Project site. The approximate depth to the base of the Chicot Aquifer is 800 to 1,200 feet; the approximate depth to the base of the Evangeline Aquifer is 2,600 to 4,000 feet. Recharge into the Chicot Aquifer mainly occurs in sandy outcrops northwest of the Project site.

The brackish to saline quality of much of the groundwater in the Jefferson County area limits its uses and, consequently, industries, agricultural users, and large municipalities obtain most of their fresh water from surface water sources. Surface water use is discussed later within this report. Wells existing in Jefferson County are prevalent in the northern and western portions of the county, where groundwater salinity can be lower than on the eastern and southern (more coastal) portion of the Jefferson County. There are no important groundwater withdrawal areas in the Gulf Coast Aquifer within 150 feet of the Project site.

2.4.1 Sole Source Aquifer Designation

The Project will be located above the coastal lowlands aquifer system in eastern Texas. This system underlies most of the Gulf Coastal Plains, extending from southern Texas to the Florida panhandle (Renken 1998). The coastal lowlands aquifer system is one of the most extensively used aquifer systems in the southern U.S. and yields large quantities of water for agricultural, commercial, industrial, and public/domestic supplies (Renken 1998). The mapped hydrologic unit underlying the Project area is the Chicot Aquifer.

The Project site does not overlie an EPA-designated sole-source aquifer, and construction and operation of the Project facilities will therefore not affect any designated sole-source aquifers. Sole-source aquifers are defined by the EPA pursuant to Section 1424(e) of the Safe Drinking Water Act of 1974, and include those aquifers that contribute to more than 50 percent of the drinking water to a specific area and for which there are no reasonably available alternative sources of water, should the aquifer become contaminated. For clarification, the EPA has designated the Chicot Aquifer as a sole-source aquifer in southwestern Louisiana, across the Texas-Louisiana border. Although the Chicot Aquifer underlies the Site, it does not carry an EPA sole-source aquifer designation inside Texas.

2.4.2 Surficial Aquifers

The term surficial aquifer is applied to an aquifer in unconsolidated sediments, for example, sand and gravel, which is encountered between the soil and the bedrock (solid or consolidated rock). Surficial aquifers in the vicinity of the Project site are brackish and saline and are unsuitable for domestic use. Depth to groundwater in Jefferson County ranges from approximately 10 to 50 feet below ground surface. Groundwater at the Project site was not reached until 25 feet below ground surface.

2.4.3 Water Supply Wells

Water supply in the area of the Project is provided through municipal sources. The nearest registered well is located 2.7 miles north-northwest of the site (TWDB, 2003). There are no drinking water wells located within 150 feet of the Project site. A 10-inch-diameter water supply pipeline follows SH 87. This pipeline will be rerouted with the other pipelines in the corridor that parallel SH 87. Potable water for the Project will be supplied from this pipeline. Because the nearest water well is located more than 2 miles from the project area, refueling or storage of hazardous materials will not be a concern relative to proximity to water wells.

2.5 ENVIRONMENTAL CONSEQUENCES

2.5.1 Surface Water

The Port Arthur Ship Canal will experience some temporary siltation or sedimentation resulting from the construction of the Project during the dredging of the ship berth. No municipal water supplies or watershed protection areas will be disturbed by the construction of the Project. No potable water intake sources are located within three miles downstream of the Project.

Construction of the marine terminal will require the removal of approximately 6.9 million cubic yards of material in the formation of the new slip adjacent to and the turning basin within the Port Arthur Ship Canal. It is anticipated the landward area of the marine terminal will be excavated prior to excavation of the slip confluence with the Port Arthur Ship Canal, thus avoiding much of the potential sedimentation and turbidity that would otherwise occur if the dredging began at the land/water interface. However dredging of the slip entrance will likely result in temporary siltation and sedimentation impacts similar to those that currently occur during maintenance dredging activities. Dredging activities at the slip entrance will temporarily suspend sediment and increase turbidity in the area of the dredging. It is anticipated that the pumps used to convey the material from the cutter heads, in a hydraulic dredging operation, will serve to contain most of the siltation caused by the dredging as the siltation will be conveyed with the material removed to the disposal area where it will settle out before being discharged back to the waterbody. The suspended solids and turbidity levels will decline to ambient following completion of dredging activities. Turbidity resulting from dredging could reduce light penetration and the corresponding primary production of aquatic plants, algae, and phytoplankton in the slip area. The suspension of organic materials and sediments could cause an increase in biological and chemical concentrations in the slip area. Lower dissolved oxygen concentrations could cause a temporary displacement of motile organisms and may stress or kill sessile benthic organisms within the affected area.

A brief analysis of the turbidity generated by the dredging operation at the Project site (Appendix 2.C) concluded that the proposed dredging activities for the Project are unlikely to have extensive adverse effects in the Port Arthur Ship Canal. The ambient turbidity levels in the

water (generated by flows, waves and ship traffic) create a high background level of turbidity thereby reducing the relative impact of dredging-related turbidity.

Project specifications and guidelines for dredging will comply with those established by the USACE for dredging in the area, including but not limited to the following:

- USACE Engineering Manuals: EM 1110-2-5025 Dredging and Dredge Material Disposal and EM 1110-2-5027 Confined Disposal of Dredge Material
- USACE Technical Report: *Evaluation of Dredge Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual*
- USEPA/USACE EPA 842-B-92-008 (Rev May 2004): *Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework*

PALNG will work closely with the USACE to identify and incorporate the appropriate specifications and guidelines governing dredging activities into the dredging contract.

Land disturbing activities required for the construction of the onshore facilities of the Project will be confined to the existing property. During construction of the LNG storage tanks and other facilities, disturbed soils would be exposed to potential erosion. To minimize the impacts of erosion and sedimentation on surface waters, land disturbing and construction activities will be conducted in compliance with the FERC Plan and Procedures and the Environmental Plan. Storm water runoff from the disturbed portions of the site will be managed in accordance with the SWPPP. The preliminary SWPPP is presented in Resource Report 1, Appendix 1.B Environmental Plan. These plans will be finalized upon completion of detailed engineering and design and provided to the FERC for review. PALNG will install all necessary erosion and sedimentation control structures as required by the TCEQ and in compliance with FERC's Plan and Procedures. Following appropriate treatment, all construction storm water from the Project site will be directed towards existing drainage ditches.

Spills, leaks, or other releases of hazardous materials during construction or operation of the Project facilities could adversely impact water quality. Hazardous materials entering nearby waterbodies as a result of spilled materials being flushed into waterbodies with storm water runoff or entering the Port Arthur Ship Canal directly from leaks or spills along the LNG loading facility could have an adverse impact on water quality and aquatic organisms. To minimize the potential for accidental releases of hazardous materials and to establish proper protocol concerning minimization of, containment of, remediation of, and reporting of any releases which occur, PALNG will develop a site-specific Spill Prevention, Containment and Countermeasure (SPCC) Plan for both construction and operational phases of the Project. A preliminary SPCC Plan is provided in Resource Report 1, Appendix 1.B Environmental Plan.

Following construction of the Project facilities, the amount of impervious surface area at the terminal site will be increased, resulting in an increased volume of storm water runoff. A storm water management system will be designed and constructed to accommodate this increase in runoff volume, and a Storm Water Management Plan will be prepared to comply with TCEQ and EPA requirements. During normal operation of the Project, surface water discharges will be limited to storm water runoff. These discharges will be directed to NPDES-permitted discharge points.

LNG ship activity at the loading facilities may result in minor resuspension of bottom sediments into the water column resulting in a temporary increase in turbidity within the slip. Resuspension of bottom sediments and resulting increases in turbidity are considered temporary short-term impacts. Use of shallow draft tugs to assist LNG ships throughout the mooring and departure operations may result in some resuspension of bottom sediments and increase turbidity over the short-term until they become stabilized.

Hydrostatic Testing Water Withdrawal and Discharge

Water used for testing is expected be obtained from the City of Port Arthur water line or from water purchased from the Lower Neches River Authority and no environmental effects will occur from the withdrawal of this water from surface water sources. Chemical additives will not be used in the test water. The test water is expected to be discharged to the Port Arthur Ship Canal, or otherwise managed in compliance with Texas hydrostatic test water discharge permit requirements.

Waterbody Crossings

PALNG will conduct construction activities in accordance with FERC's Plan and Procedures. The amount of equipment utilized at one time at any one waterbody/wetland crossing location as well as the time period needed to perform the required work will be kept to a minimum to mitigate potential effects.

During road and pipeline construction activities at or near waterbody crossings, disruption to waterbody flow will be limited and care taken to limit the increase in the suspended sediment concentrations of the watercourse. More particularly, adequate flow rates will be maintained in waterbodies to limit the potential effects to aquatic life. In addition, banks that have been cut will be stabilized as soon as possible after construction activities have been completed.

All waterbody bank reclamation will be in accordance with engineering drawings, erosion and sedimentation control requirements, and permit requirements. Resource Report 1 - General Project Description describes measures used to minimize affects to waterbodies.

Erosion and Sedimentation Control During Construction and Operation

Surface runoff and erosion from the right-of-way (ROW) and construction areas will be minimized in accordance with FERC's Plan. Potential increases in sediment from construction would be related to short-term suspended sediment concentrations in water downstream from the construction activities. The effects from these are expected to be minimal. There no erosion and sedimentation effects associated with the operation of the road, utility corridors, or pipeline corridors other than what will be associated with emergency repairs, if needed.

Potential Releases of Chemicals

In the unlikely event of a release of petroleum products, chemicals or hydrocarbons from refueling of construction equipment, fuel storage, or equipment failure, the entity responsible for construction of the road, pipelines, and utility corridors will minimize the potential effects by immediately implementing measures in the appropriate construction or operation SPCC Plan.

2.5.2 Wetlands

The Project construction impat on wetlands will be the permanent loss of XXX acres of wetlands, including XXX acres of emergent wetlands, XXX acres of tallow-dominated forested wetlands, and XXX acres of scrub-shrub wetlands, as shown in Table 2.2-1. No EFH wetlands are affected by the construction of the Project site or the dredged material disposal area.

The loss of the XXX acres of wetlands due to construction of the Project will be mitigated as determined by the USACE, following the submittal of a Section 404 permit application. As part of the Section 404 permit process, PALNG will prepare a mitigation plan that will address compensation for permanently impacted wetlands on the Project site. This plan will be submitted to all the appropriate Federal and state agencies for review and comment. PALNG will avoid impacts to wetlands to the extent practical, consistent with Executive Order 11990. To the extent practicable, PALNG will minimize impacts to the wetlands on the Project site property, by implementing the measures in FERC's Procedures. Operation and maintenance of the Project will not further impact any wetlands.

2.5.3 Groundwater Resources

No significant impacts are expected to occur to groundwater resources from construction and operation of the Project. Potential impacts to groundwater resources will be avoided or minimized by the use of both standard and specialized construction techniques. No groundwater withdrawals will be required for the construction, operation, or maintenance of the Project, and therefore, there will be no lowering of the local groundwater table.

No blasting activities are anticipated during construction, therefore no adverse effects due to blasting on water wells, springs, and wetlands are expected. No wells occur within 150 feet of the Project site. As there will be no effects, measures anticipated to detect and remedy such effects are unnecessary.

Resource Report 1, Appendix 1.B Environmental Plan includes PALNG's SPCC Plan. It contains provisions to ensure that the unforeseen impacts to groundwater resources are responded to and addressed properly. In addition, PALNG will adhere to federal and state water quality standards (e.g., Clean Water Act, Sections 401, 402, and 404, and the Safe Drinking Water Act) to ensure that there will be no adverse effects on the quality of groundwater resources.

Spills or leaks of hazardous liquids have the potential for long-term impacts on groundwater resources, especially in areas where there is a high susceptibility to surface contamination. Factors in determining groundwater susceptibility to contamination are the type of underlying bedrock, depth to bedrock, depth to the water table, and characteristics of soils and surficial deposits. Of these, soil and surficial deposit characteristics are considered the most important factors in determining how susceptible an area is to groundwater contamination. Areas with sand and gravel are considered more susceptible to groundwater contamination than those areas consisting of silt and clay, mainly due to the permeability of the material.

Spill-related impacts from the construction of the Project are mainly associated with fuel storage, equipment refueling, and equipment maintenance. These potential impacts can be avoided or greatly reduced by regulating storage and refueling activities, and by requiring immediate cleanup should a spill or leak occur. The PALNG SPCC Plan describes the preventative measures to avoid spills and leaks, as well as the mitigation measures utilized to

minimize potential impacts should a spill or leak occur. Upon finalization, the Plan will designate refueling areas; spill response procedures, spill response materials, and training; mitigation measures/response; hazardous liquids quantities, storage, and disposal. By following the SPCC Plan, the potential impacts on soils, groundwater, and water wells due to spills or leaks will be minimized. Included in the Plan is the prohibition of refueling activities and storage of hazardous liquids within at least a 200-foot-radius of all private wells and at least a 400-foot radius of all municipal or community water supply wells should new information indicate that these wells exist in the vicinity of the Project site.

It is not anticipated that pile driving operations will have any detrimental effect on the groundwater or aquifers supporting water wells in the Project area (nearest registered water supply well is 2.7 miles from the Project site). Borings drilled at the site reveal the sub-soils to be predominantly clays of low hydraulic conductivity. There is a 25-foot-thick stratum of dense to very dense silty fine sand at about a 155 foot depth below existing grade. The sand stratum is not of very high hydraulic conductivity and, therefore, is not considered to be a good aquifer. Driven piles are expected to terminate above the sand stratum, i.e., into the layer of clay of very low hydraulic conductivity. Even if a few piles are driven into the sand stratum, neither the soil nor the water from the shallow depth will be carried into the sand stratum by the pile. In addition, the clayey sub-soil above the sand stratum is not known to have any contaminants.

Neither construction nor operation of the Project will have a measurable effect on groundwater quality or quantity. Groundwater resources underlying and in the vicinity of the Project site are not used for drinking water and, therefore, drinking water supplies will be unaffected by construction or operation of the Project facilities. The addition of impervious surfaces within the facility once it has been constructed may cause an insignificant decrease in the local recharge of groundwater to the shallow water-bearing zone underlying the Project site (by converting infiltration to runoff). However, this phenomenon will not have an adverse effect on water supply, since the primary water supply in the area is surface water.

Resource Report 1, Appendix 1.B Environmental Plan includes PALNG's SPCC Plan. It contains provisions to ensure that the unforeseen impacts to groundwater resources are responded to and addressed properly. In addition, PALNG will adhere to federal and state water quality standards (e.g., Clean Water Act, Sections 401, 402, and 404, and the Safe Drinking Water Act) to ensure that there will be no adverse effects on the quality of groundwater resources.

2.5.4 Hydrostatic Testing

It is currently proposed that the hydrotest water will be water purchased from the City of Port Arthur water system or purchased from the Lower Neches River Water Authority and transported to the terminal in barges. The water will be pumped from the extraction point using floating suction hoses with strainers attached to avoid entrainment or impingement of marine organisms and to prevent drawing in unnecessary solids and silts from the riverbed.

Following the completion of the hydrostatic test, test water is expected to be discharged directly to the Port Arthur Ship Canal or J.D. Murphree Wildlife Management Area as discussed above. Energy dissipation devices will be utilized during the discharge of hydrostatic test water to control and minimize erosion and bottom scouring within the Port Arthur Ship Canal. Sediment control devices will be used to minimize turbidity and maintain compliance with water quality standards. No chemicals will be added to the hydrostatic test water before or after testing. The

hydrostatic test water withdrawal and discharge will be conducted in accordance with all Federal and Texas rules, regulations and permits.

2.5.5 LNG Ship Ballasting

An invasive species is one that has been introduced by human activity to a new geographic area or ecosystem outside of its natural range, and which has then established in the new ecosystem. If aquatic invasive species are introduced and survive, their population can increase rapidly, particularly if there are no active predators to control their numbers. Aquatic invasive species can compete with native species for food and habitat, as well as introduce parasites and diseases that can harm native species. Global shipping is the primary vector for the introduction of aquatic invasive species in marine and coastal environments (Brinkman 2006). Ballast water, bilge water, sea-chests, and hull fouling are all vectors for invasive species (Bax et al. 2003).

Project operations will require the regular transit of LNG carriers to and from the PALNG terminal, and each of these visits has the potential to result in the transfer of invasive species to the Project site. The LNG carriers will comply with both international and US Coast Guard protocols for the handling and discharge of ballast water within U.S. waters. Because the LNG carriers will be picking up their LNG cargo, they will arrive ballasted and will have to deballast while taking on the LNG cargo. The amount of ballast water a vessel will discharge will vary depending on the size of the vessel and the volume of ballast water that an individual ship captain has determined to make the ship seaworthy while moving out to the terminal.

While PALNG does not have direct control over the operations of ships calling at the terminal, it is expected that all ships will comply with international and US regulations for ballast water management. These include:

- United Nations Convention on the Law of the Sea 1982
- International Convention for the Prevention of Pollution from Ships 1973 and the 1978 Protocol (MARPOL 73/78)
- Ballast Water Management for Control of Nonindigenous Species in Waters of the United States CFR Title 33, Chapter I, Subchapter O, Part 151, Subpart D

More specifically, ships are required to follow rules in 33 CFR 151.2025 regarding ballast water management, which provides means to mitigate impacts from ballast water discharges (ballast water exchanges 200 nautical miles out from any shore). Per USCG NVIC 07-04, Change 1, ships are required to submit to the USCG, Ballast Water Management reporting of their exchanges 24 hours prior to arrival at port. They must keep records on-board for two years. This helps to ensure no invasive species will be released in the local environment, provides a means to mitigate this risk, and documents compliance.

With the adherence of vessels to these US and international protocols, PALNG anticipates that there will not be an impact from invasive species.

2.6 OTHER JURISDICTIONAL FACILITIES

Port Arthur Pipeline is building a feed-gas pipeline to the PALNG Project. That pipeline is the subject of a separate Pre-filing application under Docket PF15-19-000. The reader should review that docket for relevant information.

2.7 NON-JURISDICTIONAL FACILITIES

Two non-jurisdictional facilities are associated with the project. Approximately 3.3 miles of SH 87 and the associated pipeline and utility corridors that parallel the highway will be realigned. In addition, a set of generators for self-power for the facility will be installed. Each of these facilities is described in greater detail in RR1. The associated environmental considerations are discussed below.

2.7.1 Roadway/Pipeline/Utility Realignment

2.7.1.1 Surface Water

The surface water in the area of the highway/utility corridor relocation is the same as that described in Section 2.1.1 above for the Project site.

2.7.1.2 Wetlands

The route of the highway/utility corridor relocation was selected primarily to collocate with the existing Entergy transmission corridor and avoid the terminal site and to remain within the property owned by Port Arthur LNG Holdings, LLC, an affiliate of PALNG.

Emergent Wetlands

Emergent wetlands occur throughout large portions of the property through which the highway/utility corridor will be relocated (Figure 2.1-1). The eastern boundary of the property between the east levee and SH 87 is irregular tidal marshland dominated by saltgrass (*Distichilis spicata*), marshhay cordgrass (*Spartina patens*), cattails (*Typha latifolia*), sea-ox-eye daisy (*Borrichia frutescens*), and common reed (*Phragmites australis*). Emergent wetlands occurring within the northern property tract are non-tidal, vegetated by marshhay cordgrass, cattail, saltmarsh bulrush (*Shoenoplectus robustus*), common reed, marsh elder (*Iva frutescens*), and saltgrass.

Scrub-Shrub Wetlands

Areas meeting the criteria of scrub-shrub wetlands occur extensively throughout both the north and south tracts of the property (Figure 2.1-1). Marsh elder, black willow (Salix nigra), and tallow (Triadica sebifera) are the commonly occurring shrub species within these wetlands, but wax myrtle (Morella cerifera) and baccharis (Baccharis halimifolia) occur irregularly in association with these species. Emergent wetland species intermingle within these habitats as well. The black willow and tallow wetlands were observed along drainages that transport storm water runoff throughout the property.

Forested Wetlands

Forested wetlands were the least common wetland type observed within the boundaries of the highway/utility corridor relocation (Figure 2.1-1). All areas observed meeting the criteria of forested wetlands contained a vegetative complex dominated exclusively by either pure stands of mature black willow or tallow tree, adjoining scrub-shrub wetlands containing juvenile specimens of the same species, or contained intermixed stands of mature and scrub-shrub individuals of both species.

The tallow tree is an invasive, noxious plant species described by the USDA as a species that "causes large-scale ecosystem modification throughout the southeastern U.S. by replacing

native vegetation". In the areas of the highway/utility corridor relocation containing tallow groves, vegetation species diversity is limited due to the tallow's ability to out-compete and shade out other plant species resulting in near homogenous stands of this species.

Based upon the negative effects of this species on the ecosystem, it appears that the forested wetland areas within the highway/utility corridor site dominated by this species should not be assigned comparable functional values as other native forested wetland habitats. Because the tallow wetlands pose a threat to adjacent natural wetland habitats, these tallow wetlands would be assigned a negative functional value.

Black willows are an important species for bank stabilization of stream channels, sediment retention, and provide moderate wildlife food and nesting value. These species occur as near homogenous stands or are in association with tallow trees, and while they technically meet the criteria of forested wetlands, these areas do not have the same value as that of a natural forested wetland containing a diverse population of mature hardwood tree species.

NWI Designated Wetlands

USFWS NWI maps were also consulted to identify the potential occurrence of wetlands along the route of the relocated highway/utility corridor and compared with results of the field surveys. Based on the information presented on the NWI maps (Figure 2.2-2), the majority of the road/pipeline corridor relocation route contains wetlands of the following types:

PEM1Khs - Palustrine Emergent, Persistent, Artificial, diked, spoil;

PEM1A - Palustrine Emergent, Persistent, Temporary;

PSS1Ahs - Palustrine Emergent, Persistent, diked, spoil; and

E2SS3P - Esturine Intertidal, Scrub-shrub, Broad-leaved evergreen, Irregular.

The NWI designations are consistent with the findings of the field delineation.

Essential Fish Habitat Wetlands

No EFH wetlands are crossed by the highway/utility corridor relocation.

Wetland Areas Affected

The relocated route of SH 87 is approximately 3.6 miles or 19,000 feet in length. Of this total, XXX feet crosses areas meeting the wetland criteria of various quality (Figure 2.1-1). In the North Tract, wetland habitats affected by the construction of the highway/utility corridor reroute include:

- Tallow/Phragmites/Typha - PEM1Khs; and
- Spartina wetland (*S. patens and S. spartinea*) - PEM1Khs.

In the South Tract, wetland habitats affected by the construction of the highway/utility corridor relocation include:

- Tallow - PSS1/PFO1Kh;
- Rhynchospora/Typha/Polygonum - PEM1Kh;
- Tallow/Iva/Schoenoplectus/Typha Mosiac - PSS1Kh;

- Borrichia/Polygonum/Eriochloa - PEM1Khs;
- Iva/Tallow - PSS1Khs;
- Phragmites/Typha - PEM1Khs; and
- Sand/Mud Flat - PEM1Khs.

The 120-foot-wide highway corridor will affect XX acres of low quality tallow dominated forested wetlands and XXX acres of non-forested (scrub-shrub and emergent) wetlands with the permanent loss of XXX acres associated with the highway pavement and hard shoulders. The remaining portion of the ROW will be allowed to revert to its pre-construction state following utility placement and associated construction activities related to the highway. The 225-foot-wide pipeline corridor will affect XXX acres of poor quality tallow-dominated forested wetlands and XXX acres of non-forested (scrub-shrub and emergent) wetlands with permanent loss of XXX acres of the poor quality tallow dominated forested wetlands. The XXX acres of the forested wetlands will revert to scrub-shrub and emergent wetlands and will be maintained as such, which will likely be of better quality than the tallow dominated wetlands they replaced.

2.7.1.3 Hydrostatic Testing

The pipelines that will be relocated as part of the highway/utility corridor relocation will be hydrotested according to US DOT, 49 CFR specifications using non-saline water purchased from the City of Port Arthur or other sources. Following hydrotesting, the water will be discharged in accordance with all state and federal permitting requirements.

2.7.1.4 Groundwater Resources

The groundwater resources in the area of the highway/utility corridor relocation are the same as that described in Section 2.1.4 above for the Project site.

2.7.1.5 Environmental Consequences

Surface Water

Construction activities will be conducted to avoid or minimize impacts to the water quality of the drainage canal crossed by the relocated highway/utility corridor and the canal that borders the western side of the relocated highway/utility corridor. These canals, in turn, drain into Keith Lake and Keith Lake Cut. PALNG will maintain an undisturbed vegetated buffer between the relocated highway/utility corridor and the canal that drains into Keith Lake to minimize both construction and operational effects. Operational activities associated with the relocated highway and pipeline corridor are not anticipated to affect surface water quality any more than the use of the existing SH 87 by vehicular traffic affects surface water quality.

Hydrostatic Testing Water Withdrawal and Discharge

Water used for testing is expected to be obtained from the City of Port Arthur water line and no environmental effects will occur from the withdrawal of this water from surface water sources. Chemical additives will not be used in the test water. The test water will be discharged to the Port Arthur Ship Canal, or otherwise managed in compliance with Texas hydrostatic test water discharge permit requirements.

Waterbody Crossings

The relocated SH 87 highway/utility corridor will cross a 50-foot-wide unnamed canal connecting Round Lake to Lost Lake and an adjacent 19-foot-wide waterbody. No other waterbodies are affected by the relocated highway/utility corridor. The highway will be constructed with an overpass to allow this waterbody to maintain its hydrologic connection with Round Lake. The TPWD had indicated in previous meetings that they are interested in having some water control structures in these waterbodies for their maintenance activities in Round Lake. Discussions with the TPWD regarding their needs are ongoing. It is currently planned to open cut these two waterbodies to install the pipeline corridor. The underground utilities will also be installed using an open cut technique and aboveground utilities will span these water bodies.

PALNG will conduct construction activities in accordance with FERC's Plan and Procedures. The amount of equipment utilized at one time at any one waterbody/wetland crossing location as well as the time period needed to perform the required work will be kept to a minimum to mitigate potential effects.

During road and pipeline construction activities at or near waterbody crossings, disruption to waterbody flow will be limited and care taken to limit the increase in the suspended sediment concentrations of the watercourse. More particularly, adequate flow rates will be maintained in waterbodies to limit the potential effects to aquatic life. In addition, banks that have been cut will be stabilized as soon as possible after construction activities have been completed.

All waterbody bank reclamation will be in accordance with engineering drawings, erosion and sedimentation control requirements, and permit requirements. Resource Report 1 describes measures used to minimize affects to waterbodies.

It is expected that construction activities in the vicinity of waterbodies will not detrimentally affect water quality except for localized and short-term events during construction.

Erosion and Sedimentation Control During Construction and Operation

Surface runoff and erosion from the ROW and construction areas will be minimized in accordance with FERC's Plan and Procedures. Potential increases in sediment from construction would be related to short-term suspended sediment concentrations in water downstream from the construction activities. The effects from these are expected to be minimal. There are no erosion and sedimentation effects associated with the operation of the road, utility corridors, or pipeline corridors other than what will be associated with emergency repairs, if needed.

Storm Water Runoff

Construction of the highway/utility corridor relocation is not anticipated to result in storm water unsuitable for discharge to nearby waterbodies. Operation of the road and relocated pipelines is not anticipated to affect storm water runoff any more so than is currently experienced. There are no areas along the road/pipeline corridor route that will release potential contaminants to adjacent lands or waters, especially due to the inclusion in the design of a vegetated buffer zone between the road ROW and the canal which drains to Keith Lake.

Potential Releases of Chemicals

In the unlikely event of a release of petroleum products, chemicals or hydrocarbons from refueling of construction equipment, fuel storage, or equipment failure, the entity responsible for construction of the road, pipelines, and utility corridors will minimize the potential effects by immediately implementing measures in the appropriate construction or operation SPCC Plan.

Wetlands

The impact of construction of the highway/utility corridor on wetlands will affect approximately XXX acres of non-forested (scrub-shrub and emergent) wetlands and XXX acres of low quality tallow-dominated forested wetlands (Table 2.2-2). No EFH wetlands will be affected by the highway/utility corridor relocation. Approximately XXX acres of these two wetland types will be permanently lost, although the portion not included in the road pavement or hard shoulders will likely revert to and be maintained in a herbaceous wetland ty

The permanent loss of wetlands due to construction of the relocated highway/utility corridor will be mitigated as determined by the USACE, following the submittal of a Section 404 permit application. As part of the Section 404 permit process, PALNG will prepare a mitigation plan that will address compensation for permanently impacted wetlands (including tidally influenced) along the relocated highway/utility corridor route. This plan will be submitted to all the appropriate federal and state agencies for review and comment. PALNG will avoid impacts to wetlands to the extent practical, consistent with Executive Order 11990. To the extent practicable, PALNG will minimize impacts to the wetlands along the relocated highway/utility corridor route by implementing the measures in FERC's Procedures provided in Resource Report 1, Appendix 1.B Environmental Pl Operation and maintenance of the relocated highway/utility corridor route will not further impact any wetlands.

Groundwater Resources

No significant impacts are expected to occur to groundwater resources from construction and operation of the relocated highway/utility corridor. Potential impacts to groundwater resources would be avoided or minimized by the use of both standard and specialized construction techniques. No groundwater withdrawals would be required for the construction, operation, or maintenance of the highway/utility corridor, therefore, there will be no lowering of the local groundwater table.

No blasting activities are anticipated during construction, therefore no adverse effects due to blasting on water wells, springs, and wetlands are expected. No wells occur within 150 feet of the highway/utility corridor route. As there will be no effects, measures anticipated to detect and remedy such effects are unnecessary.

Resource Report 1, Appendix 1.B will contain PALNG's Environmental Plan, including its SPCC Plan. This document contains provisions to ensure that the unforeseen impacts to groundwater resources are responded to and addressed properly. In addition, PALNG will adhere to federal and state water quality standards (e.g., Clean Water Act, Sections 401, 402, and 404, and the Safe Drinking Water Act) to ensure that there will be no adverse effects on the quality of groundwater resources.

Spill-related impacts from the construction of the highway/utility corridor relocation are mainly associated with fuel storage, equipment refueling, and equipment maintenance. These potential

impacts can be avoided or greatly reduced by regulating storage and refueling activities, and by requiring immediate cleanup should a spill or leak occur. The SPCC Plan prepared for the Project will describe in detail the preventative measures to avoid spill or leaks and mitigative measures that will be utilized to minimize potential impacts should a spill or leak occur. These same measures will be applicable to the highway/utility corridor relocation. Upon finalization, the Plan will designate refueling areas; spill response procedures, spill response materials, and training; mitigative measures/response; hazardous liquids quantities, storage, and disposal. By following the SPCC Plan, the potential impacts on soils and groundwater due to spills or leaks will be minimized.

The highway/utility corridor relocation will have no measurable effect on groundwater quality or quantity. Groundwater resources underlying and in the vicinity of the relocated road/pipeline corridor route are not used for drinking water and, therefore, drinking water supplies will be unaffected by construction or operation. Neither construction nor operation of the Project facilities will use local groundwater resources and, therefore, will not affect groundwater quality or quantity.

2.7.2 Self-Power Generator

Electric power for the liquefaction trains will be generated onsite using nine gas turbine driven generators (eight plus a spare) each with a nominal capacity of 34 megawats (MW) each. Because the equipment will be located within the facility, no additional impacts to Water Resources will result from this source.

2.8 CUMULATIVE IMPACTS

Text to be developed and submitted in the futur

2.9 REFERENCES

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TABLES

TABLE 2.1-1

Water Quality Standards for Sabine-Neches Canal Tidal(Segment 0703)

Parameter	Water Quality Standard
Dissolved Oxygen (min)	4 mg/L
pH (min)	6.5
pH (max)	9.0
Fecal Coliform (max)	200 colonies per 100 milliliter (mL)
Enterococci (max)	35 colonies per 100 mL
Temperature (max)	95 deg F

TABLE 2.1-2

Composite Sample Results for Sediments at the LNG Terminal Site

Parameter	Composite Sample Result (mg/kg)	Thresholds Effects Level (mg/kg)[a]	Ecological Benchmark for Freshwater Sediment (mg/kg)[b]	Ecological Benchmark for Marine Sediment (mg/kg) [c]
Arsenic[d]	4.96	7.24	5.90	8.20
Cadmium[d]	Not Detected	0.676	0.596	1.20
Chromium[d]	17.9	52.3	37.3	81.0
Lead[d]	17.9	30.2	35.0	46.7
Mercury[d]	0.036	0.130	0.174	0.150
Silver[d]	Not Detected	0.733	1.00	1.00
Chrysene[d]	Not Detected	0.108	0.057	0.384
Pyrene[d]	Not Detected	0.153	0.053	0.665
Arclor 1016 (PCB)[e]	Not Detected	0.022	0.007	Not Available
Arclor 1254 (PCB)[e]	Not Detected	0.022	0.060	Not Available
Archlor 1260 (PCB)[e]	Not Detected	0.022	0.005	Not Available
Archlor 1248 (PCB)[e]	Not Detected	0.022	0.030	Not Available

(a) *Data from the Environmental Protection Agency's* National Sediment Quality Survey *(1996).*

(b) Data from the Texas Commission on Environmental Quality's RG-263 (2001) Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas.

(c) Data from the Texas Commission on Environmental Quality's RG-263 (2001) Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas.

(d) Composite result from over 46 samples collected throughout site from zero to 24 feet below surface.*

(e) Composite result from three samples collected from the channel.*

*Port Arthur LNG – LNG Terminal Site, Soil and Sediment Characterization Study 2004

TABLE 2.2-1

Wetlands Affected by the Port Arthur Terminal Project

Wetland Type	NWI Classification	Project Area (acres)	Construction Impacts (acres) (Temporary)	Operational Impacts (acres) (Permanent)
Palustrine Emergent Wetland	PEM	XXX		
Scrub / Shrub Wetland	PSS	XXX		
Estuarine Emergent Wetland	E2EM	XXX		

TABLE 2.2-2

Wetlands Affected by the Highway / Utility Corridor Relocation

Wetland Type	NWI Classification	Project Area (acres)	Construction Impacts (acres) (Temporary)	Operational Impacts (acres) (Permanent)
Palustrine Emergent Wetland	PEM	XXX		
Scrub / Shrub Wetland	PSS	XXX		
Estuarine Emergent Wetland	E2EM	XXX		

FIGURES

Path: Y:\Projects\Sempra_LNG\Port_Authur_LNG\Port_Arthur_LNG_Terminal\Maps\FERC\2015_06\PALNG_RR02_221_Wetlands.mxd

Site Location

Legend

- Approximate Property Boundary
- Delineated Wetlands (TB Smith; 2014)
- Water Line
- Emergent Wetland
- Estuarine Wetland
- Scrub Shrub Wetland

Wetlands: TB Smith, 2014
Map Projection: NAD83 UTM 15N (US Feet)

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

Port Arthur LNG Liquefaction Project

Wetland Delineation of the Terminal

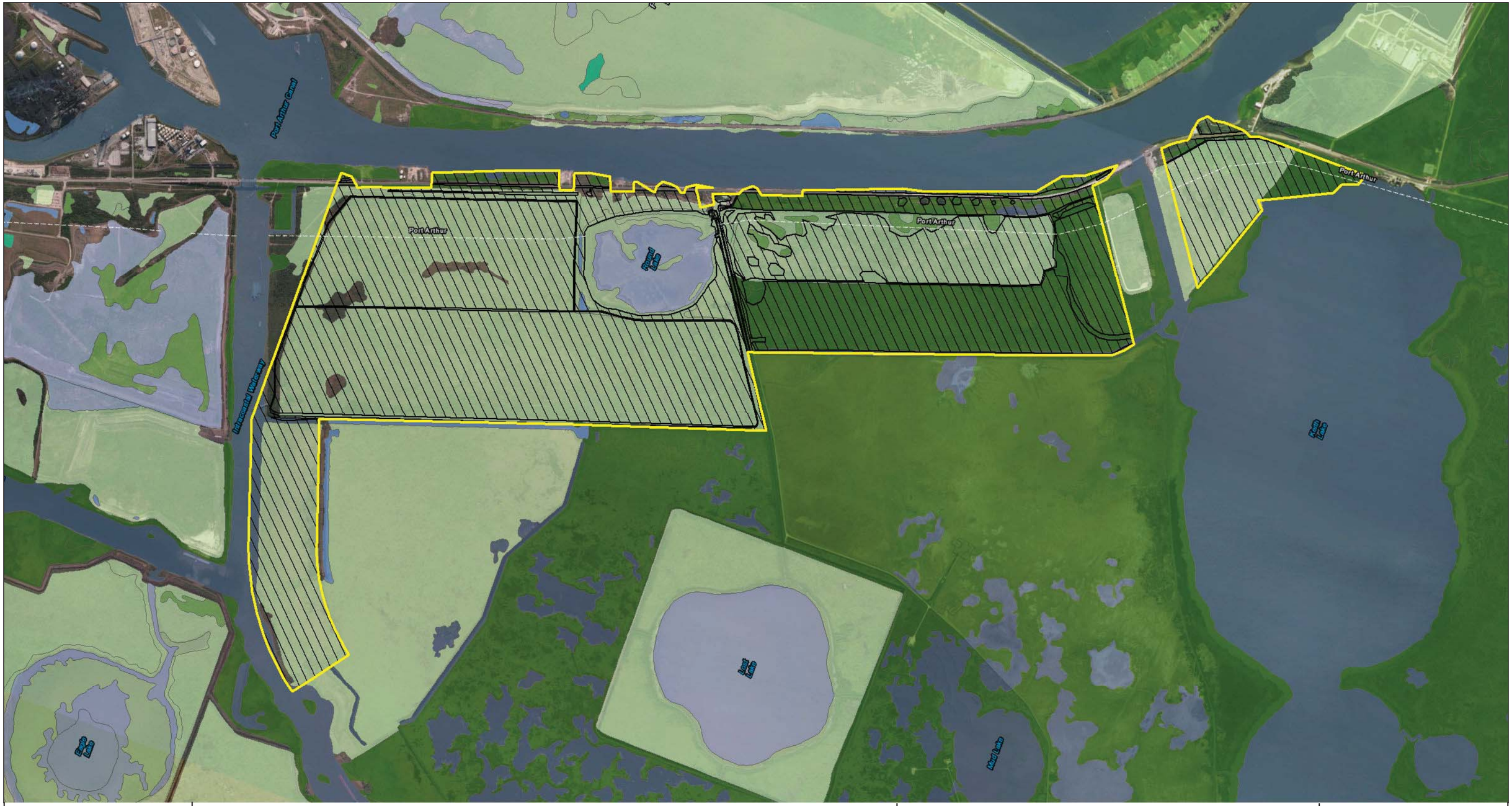
Port Arthur LNG

AECOM

June 2015

Figure 2.2-1

Path: Y:\Projects\Sempra_LNG\Port_Authur_LNG\Port_Arthur_LNG_Terminal\Maps\FERC\2015_06\PALNG_RR02_222_NWI.mxd



Site Location

Legend

- Approximate Property Boundary
- Delineated Wetland (TB Smith; 2014)

NWI Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Estuarine and Marine Wetland
- Freshwater Pond
- Lake
- Estuarine and Marine Deepwater
- Other

Wetlands: USGS National Wetland Inventory (NWI)
Delineated Wetlands: TB Smith;2014
Map Projection: NAD83 UTM 15N (US Feet)

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

Port Arthur LNG Liquefaction Project

NWI Wetland

Port Arthur LNG AECOM

June 2015

Figure 2.2-2

APPENDIX 2.A
Correspondence

APPENDIX 2.B

Project Site Soil and Sediment Characterization Study

Port Arthur LNG
LNG Terminal Site
Soil and Sediment Characterization Study

Port Arthur LNG
LNG Terminal Site Soil and Sediment Characterization Study

Introduction

A site reconnaissance was conducted in August 2004, to identify environmental conditions of concern and conditions that would indicate contamination of the LNG terminal site. The site reconnaissance revealed evidence of prior oil and gas exploration and transmission activities at the LNG terminal site, as well as possible dredged material disposal. As a result of the prior activities, soil and sediment samples were collected as part of the initial planning to determine if the material to be dredged as part of the Project could be used for beneficial reuse projects.

Framework for Study

Port Arthur LNG used the Environmental Protection Agency's (EPA's) *Inland Testing Manual* (ITM) as guidance. The testing protocols set out in the ITM are intended solely as guidance for use in conducting testing of dredged material to assess the potential for contaminant-related impacts associated with dredged material disposal. The ITM does not alter the statutory and regulatory framework for permitting decisions under section 404 through the U.S. Army Corps of Engineers (USACE). Under that framework, testing is conducted in order to assist the permitting authority in making factual determinations regarding the effect of the discharge on the aquatic ecosystem, and in determining whether the discharge will comply with the 404(b)(1) Guidelines. The current regulations provide for testing under certain circumstances, and the ITM provides suggested protocols to follow once it has been decided that testing is appropriate. The Guidelines provide flexibility to the permitting authority to decide, based upon the facts of a particular case, whether testing is warranted. At this time the USACE has not asked for additional testing. The recipient of the material may also have their own standards or testing requirements.

The ITM uses a tiered approach to evaluation of dredged material that begins with Tier I. The initial tier (Tier I) uses readily available, existing information (including all previous testing). For certain dredged materials with readily apparent potential for environmental impact (or lack thereof), information collected in Tier I may be sufficient for making factual determinations. However, more extensive evaluation (Tiers II, III and IV) may be needed for other materials with less clear potential for impact or for which Tier I information is inadequate.

The goal of Tier I is to reach one of the following conclusions:

- Existing information does not provide a sufficient basis for making factual determinations. In this case, further evaluation in higher tiers is appropriate.
- Existing information provides a sufficient basis for making factual determinations. In this case, one of the following decisions is reached:
    - The material meets the exclusion criteria.
    - The material does not meet the exclusion criteria but information concerning the potential impact of the material is sufficient to make factual determinations.

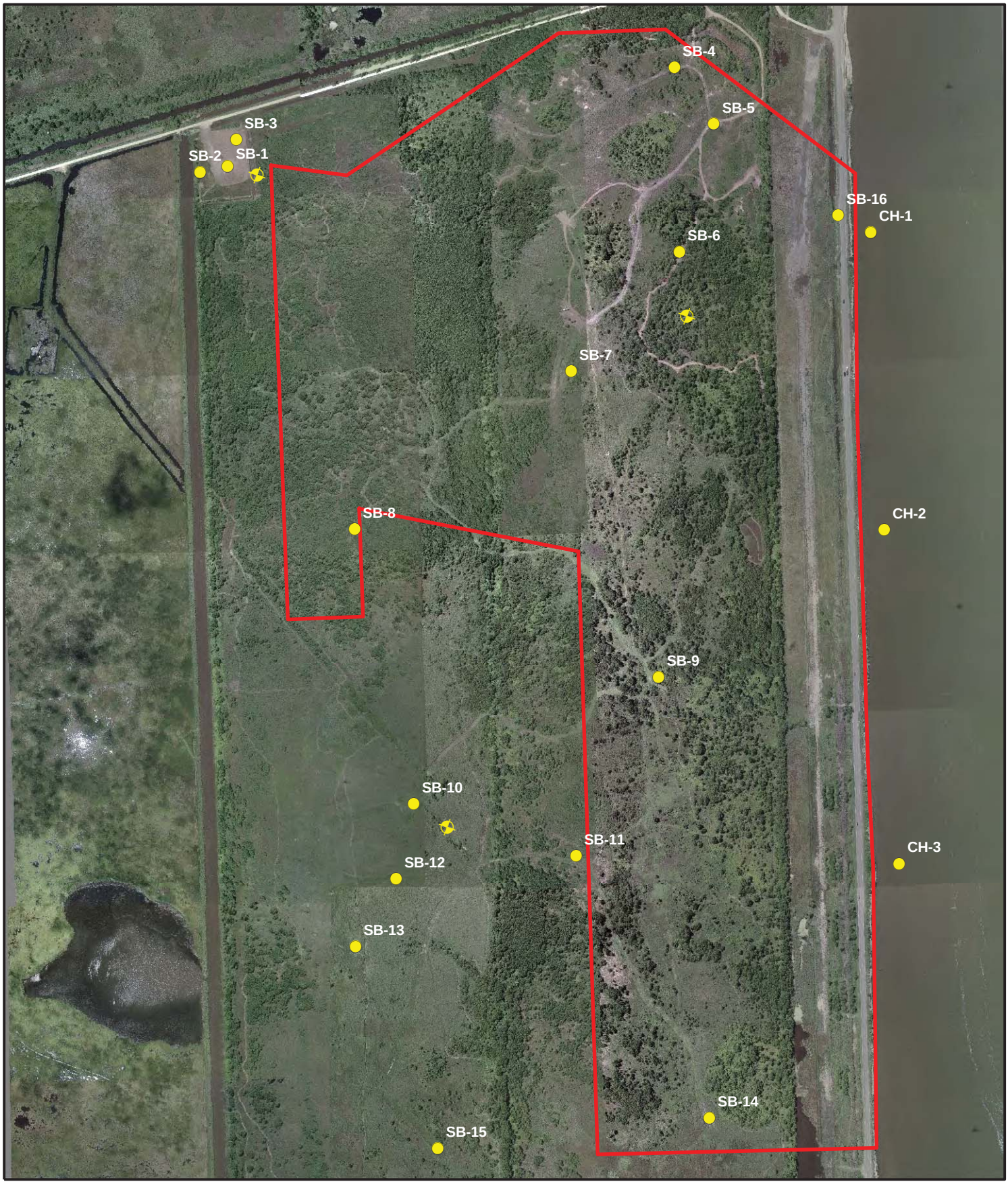
The initial focus of the Tier I evaluation is on information relevant to Sections 230.60 (a), (b), (c), and (d) of the Guidelines and the potential for contaminant-associated impacts upon discharge. These four sections of the Guidelines fully define the exclusions from testing, which are summarized below.

1. If an evaluation of the dredging site indicates that the dredged material is not a "carrier of contaminants", testing may not be necessary. Such situations are most likely to arise if: the dredged material is composed primarily of sand, gravel and/or inert materials; the sediments are from locations far removed from sources of contaminants; the sediments are from depths deposited in pre-industrial times and not exposed to modern sources of pollution. The LNG terminal site is between two large industrial areas, and is adjacent to State Highway 87 and the Port Arthur Ship Canal. The LNG terminal site does not meet this exclusion.
2. Testing may also not be necessary "where the discharge site is adjacent to the excavation site and subject to the same sources of contaminants, and materials at the two sites are substantially similar "(Section 230.60(c)). However, some physical and chemical testing may be necessary to confirm that the two sites are "substantially similar". The rationale behind this exclusion from testing is that when 1) the discharge and excavation sites are adjacent, 2) the concentration of contaminants in the two sites are not substantially different, and 3) the geochemical environments are similar, then the bioavailability of contaminants at the two sites are likely to be similar. This exclusion can apply even if the dredged material is a carrier of contaminants, providing that "dissolved materials and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas". The LNG terminal site may qualify for this exclusion depending on the disposal site chosen.
3. Section 230.60 (d) states that testing may not be necessary with material likely to be a carrier of contaminants if constraints acceptable to the USACE District Engineer and EPA Regional Administrator are available to "reduce contamination to acceptable levels within the disposal site and to prevent contaminants from being transported beyond the boundaries of the disposal site". Such constraints may involve technologies such as capping and underwater containment. Design and monitoring requirements for such constraints should be determined by the EPA and USACE on a case-by-case basis. The LNG terminal site could qualify for this exclusion, if it is determined that contaminants are present that need to be reduced.

If the exclusionary criteria are satisfied, factual determinations for the dredged material can be made and no further evaluation is necessary. If the exclusionary criteria are not met, the material is evaluated on all existing information. Although this site may qualify for the second exclusion, Port Arthur LNG collected additional data to further support it.

Sample Collection

The study included the collection of 15 soil borings and three sediment samples from the Port Arthur Ship Canal at the Project site. Sample locations were spread across the site, as shown in Figure 1.



Sempra Energy LNG

Sempra Energy International

Figure 1

Soil Sample Locations for the Port Arthur LNG Project

Port Arthur LNG Project

Port Arthur Pipeline Project

Non-Internet Public

Fomer Oil and Gas Wells

Soil Bore Locations

LNG Terminal Site

0 120 240 360 480 Feet

Samples were collected by hydraulically driving a two-inch-diameter stainless steel rod with a plastic sleeve in a stainless steel sampler (4 feet in length) into the subsurface. Even though a 4-foot sampler was used, the unconsolidated and wet nature of the subsurface returned a compressed sample that measured 2.5 feet to 3 feet in length. Soil cores were continuously sampled to a maximum depth of 16 feet below ground surface. Soil borings one through four were drilled to a depth of 24 feet. The depth of these borings was determined to ensure the penetration of native soils underlying the suspected overlying dredged material disposal areas. The remaining soil borings were taken to maximum depth of 16 feet.

Soil samples were retained for laboratory analysis. The soil samples that were collected for laboratory analysis were transferred from the plastic sleeve to pre-cleaned containers and labeled as follows:

- Sample Identification Number;
- Date and time of collection;
- Analysis;
- Preservative (if applicable); and
- Sampler's initials.

The container was immediately labeled and stored on ice in a cooler for delivery to the laboratory. Between uses, all sampling instruments (including knives, spoons, and bowls) were decontaminated. All samples were shipped under a chain-of-custody. The chain-of-custody form was initiated as the sample was collected and included identifying information, such as sample identification number, and laboratory analyses requested. The chain-of-custody form was included with the cooler in which the samples were shipped.

Samples were packaged in coolers and packed with ice to maintain a temperature of at least four degrees Celsius. Each sample bottle was labeled, as described above. The bottle was then sealed in a Ziploc bag and placed in the cooler. The chain-of-custody form was placed in a Ziploc bag and placed inside the cooler. Once the samples were secured with packing materials and ice, the cooler was closed and taped shut. The samples were shipped for analysis to a certified lab in Houston, Texas, via an overnight courier.

Laboratory Analysis

Analytical methods used were those specified by the EPA regulations and guidelines (EPA 901/3-88-001). Samples were analyzed for arsenic, barium, cadmium, total chromium, lead, mercury, selenium, silver, chrysene, pyrene. Channel sediments were also analyzed for polychlorinated biphenyls (PCBs) (i.e., Archlors). The laboratory analytical results from the soil samples were compared to The National Sediment Quality Survey used by the USACE Galveston District. The results are shown in Table 1.

TABLE 1

Sample Results for Sediments at the LNG Terminal Site

Sample Identification No.	Sample Date	Sample Depth (feet)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selinium (mg/kg)	Silver (mg/kg)	Chyrysene (mg/kg)	Pyrene (mg/kg)
National Sediment Quality Survey - Screening Values: Threshold Effects Level (mg/kg)			7.24	Not Available	0.6760	52.3	30.2	0.130	Not Available	0.733	0.1080	0.1530
SB-1	3/16/2004	0-4	7.15	2,030	0.166 J (a)	21.3	**42.7**	0.106	1.9	0.0875 J	NA (b)	NA
SB-1	3/16/2004	12-16	5.43	246	0.0701 J	9.28	12.9	0.0195 J	1.34	0.445 J	NA	NA
SB-1	3/16/2004	20-24	5.46	90.2	0.076 J	11.5	14.9	0.0248 J	1.98	0.052 J	NA	NA
SB-2	3/16/2004	0-4	5.28	56.2	0.0686 J	13.3	16	0.043	1.59	0.0482 J	NA	NA
SB-2	3/16/2004	12-16	4.67	47	0.0523 J	6.9	7.62	0.0197 J	0.765	0.025 J	NA	NA
SB-2	3/16/2004	20-24	5.74	125	0.072 J	8.83	10.3	0.0223 J	0.961	0.0319 J	NA	NA
SB-3	3/17/2004	0-4	4.95	128	0.183 J	17.7	**30.8**	0.101	1	0.0619 J	NA	NA
SB-3	3/17/2004	12-16	3.68	25.6	0.0349 J	5.23	6.24	0.0144 J	0.704	ND	NA	NA
SB-3	3/17/2004	16-24	5.44	53	0.0552 J	8.48	11.8	0.0195 J	0.964	0.0339 J	NA	NA
SB-4	3/17/2004	0-4	7.02	59.8	0.0893 J	14	16.2	0.0242 J	0.895	0.0309 J	ND (c)	ND
SB-4	3/17/2004	4-8	4.68	96.2	0.177 J	10.4	22.4	0.0711	0.952	0.0393 J	0.015	ND
SB-4	3/17/2004	20-24	4.22	30.3	0.056 J	8.65	10.1	0.0286	0.789	0.0281 J	ND	ND
SB-5	3/17/2004	0-4	7.19	65	0.196 J	9.54	15	0.0328	2.12	0.0417 J	NA	NA
SB-5	3/17/2004	8-12	6.04	65.8	0.101 J	13	**45.1**	0.113	1.62	0.0796 J	NA	NA
SB-5	3/17/2004	12-16	5.36	51.8	0.104 J	12.6	29.0	0.0856	0.744	0.0632 J	NA	NA
SB-6	3/19/2004	0-4	5.96	96.7	0.0547 J	7.76	12.5	0.0237	0.949	0.0341 J	NA	NA
SB-6	3/19/2004	8-12	5.6	66.3	0.0518 J	11.8	24.3	0.0574	1.03	0.0425 J	NA	NA
SB-6	3/19/2004	12-16	4.34	37.9	0.0777 J	13.9	15.4	0.0449	1.39	0.0543 J	NA	NA
SB-7	3/19/2004	0-4	4.37	70	0.0793 J	10.1	19.2	0.0301	0.706	0.0511 J	NA	NA
SB-7	3/19/2004	8-12	2.49	44.9	ND	12.9	13	0.0458	0.608	ND	NA	NA
SB-7	3/19/2004	12-16	6.36	59.2	0.28 J	13.8	13.5	0.0329	1.15	0.0566 J	NA	NA
SB-8	3/19/2004	0-4	5.01	109	0.315 J	15.1	**32.6**	0.0495	1.32	0.0622 J	ND	ND
SB-8	3/19/2004	8-12	3.21	12.7	0.203 J	5.34	5.44	0.00662 J	0.495	0.0332 J	ND	ND
SB-8	3/19/2004	12-16	5.09	27.8	0.187 J	5.1	9.73	0.00573 J	ND	0.074 J	ND	ND

TABLE 1 *Cont'd*
Sample Results for Sediments at the LNG Terminal Site

Sample Identification No.	Sample Date	Sample Depth (feet)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selinium (mg/kg)	Silver (mg/kg)	Chyrysene (mg/kg)	Pyrene (mg/kg)
SB-9	3/19/2004	0-4	4.74	57.9	0.224 J	9.85	16.9	0.0354	0.674	0.0407 J	ND	ND
SB-9	3/19/2004	4-8	5.35	73.1	0.273 J	12.1	**35.1**	0.0597	0.855	0.07 J	ND	ND
SB-9	3/19/2004	12-16	5.04	33.4	0.239 J	8.45	12.4	.0.221	0.573	0.0362 J	ND	ND
SB-10	3/19/2004	0-4	5.63	65.3	0.348 J	13	23.9	0.0342	1.2	0.0549 J	NA	NA
SB-10	3/19/2004	4-8	5.28	58.3	0.31 J	11.7	20.3	0.0535	1.14	0.0531 J	NA	NA
SB-10	3/19/2004	12-16	1.07	95	0.212 J	4.76	9.94	0.00589 J	0.718	0.0351 J	NA	NA
SB-11	3/20/2004	0-4	3.35	83.1	0.252 J	12.7	30.1	0.0471	1.08	0.0726 J	ND	ND
SB-11	3/20/2004	8-12	4.52	57.4	0.289 J	13.9	18.2	0.0675	1.5	0.0381 J	ND	ND
SB-11	3/20/2004	12-16	3.36	30.8	0.218 J	8.71	11.1	0.0251	0.71	0.0337 J	ND	ND
SB-12	3/19/2004	0-4	5.33	98.6	0.379 J	15.7	31.2	0.103	0.93	0.0613 J	NA	NA
SB-12	3/19/2004	5-12	4.33	28.4	0.416 J	8.3	9.77	0.0183 J	0.552 J	0.0354 J	NA	NA
SB-12	3/19/2004	12-16	1.50	46.4	0.262 J	5.73	12	0.00886 J	0.463	0.0189 J	NA	NA
SB-13	3/20/2004	0-4	4.63	55	0.39 J	10.5	20.1	0.0376	1.02	0.0489 J	NA	NA
SB-13	3/20/2004	8-12	3.71	42.3	0.378 J	11	13.2	0.0319	0.747	0.0364 J	NA	NA
SB-13	3/20/2004	12-16	3.62	85.6	0.259 J	7.02	12.9	0.0226	0.589	0.0429 J	NA	NA
SB-14	3/20/2004	0-4	4.41	94	0.35 J	12	25.6	0.0612	0.735	0.0625 J	ND	ND
SB-14	3/20/2004	4-8	6.09	51.,2	0.048 J	12.1	20.1	0.0717	1.07	0.455 J	ND	ND
SB-14	3/20/2004	12-16	5.68	38.4	0.0766 J	9.36	12.5	0.0327	1.02	0.0354 J	ND	ND
SB-15	3/20/2004	0-4	**8.98**	67.5	ND	10.1	21	0.0586	0.806	0.0452 J	ND	ND
SB-15	3/20/2004	8-12	5.52	38.2	0.0644 J	10.6	13.2	0.0286	1.2	0.0361 J	ND	ND
SB-15	3/20/2004	12-16	5.5	24.7	0.0655 J	5.74	7.64	0.0229	1.09	0.0297 J	ND	ND
CH-1 (d)	3/26/2004	0-2	4.47	31.2	0.32 J	9.9	11.3	0.0303	0.766	0.0365 J	NA	NA
CH-2	3/26/2004	0-2	4.71	16.6	0.409 J	8.93	11.5	0.0252	0.804	0.0411 J	NA	NA
CH-3	3/26/2004	0-2	**10.8**	33.4	0.467 J	11.1	21.8	0.0381	1.44	0.0561 J	NA	NA

Notes: a) J = Analyte detected below quantitation limits; b) NA = Not Analyzed; c) ND = Not Detected; d) PCBs were not detected in any channel sample.

Conclusions

Two individual samples exceeded the National Sediment Quality Survey screening limit for arsenic, while five individual samples exceeded the screening limit for lead. These levels are likely representative of naturally occurring metal levels (i.e., background levels) due to the proximity of the site to the industrial area of Port Arthur. Adjacent areas, proposed for dredged material disposal or reuse, likely have similar levels of metals in the soil.

Further, the berth will be dredged using a hydraulic dredge and the material will be placed initially in a contained cell. Due to the mixing of the site soils and sediments as a result of dredging activities, the results of the soil samples were composited to reflect future conditions. The laboratory analytical results from the soil samples were compared to The National Sediment Quality Survey used by the USACE Galveston District (i.e., permitting authority) and the Texas Commission on Environmental Quality's (TCEQ's) Ecological Benchmark used by the Texas Park and Wildlife Department (TPWD) (i.e., a potential recipient). The results of the sampling and analyses are summarized in Table 2. The initial analyses indicate that the material is suitable for beneficial reuse projects. Port Arthur LNG will conduct any additional testing required by the regulatory permitting authorities as well as the recipient of the material.

TABLE 2
Composite Sample Results for Sediments at the LNG Terminal Site

Parameter	Composite Sample Result (mg/kg)	Thresholds Effects Level (mg/kg)[a]	Ecological Benchmark for Freshwater Sediment (mg/kg)[b]	Ecological Benchmark for Marine Sediment (mg/kg) [c]
Arsenic[d]	4.96	7.24	5.90	8.20
Cadmium[d]	Not Detected	0.676	0.596	1.20
Chromium[d]	17.9	52.3	37.3	81.0
Lead[d]	17.9	30.2	35.0	46.7
Mercury[d]	0.036	0.130	0.174	0.150
Silver[d]	Not Detected	0.733	1.00	1.00
Chrysene[d]	Not Detected	0.108	0.057	0.384
Pyrene[d]	Not Detected	0.153	0.053	0.665
Arclor 1016 (PCB)[e]	Not Detected	0.022	0.007	Not Available
Arclor 1254 (PCB)[e]	Not Detected	0.022	0.060	Not Available
Archlor 1260 (PCB)[e]	Not Detected	0.022	0.005	Not Available
Archlor 1248 (PCB)[e]	Not Detected	0.022	0.030	Not Available

[a] Data from the Environmental Protection Agency's *National Sediment Quality Survey* (1996).

[b] Data from the Texas Commission on Environmental Quality's RG-263 (2001) Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas.

[c] Data from the Texas Commission on Environmental Quality's RG-263 (2001) Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas.

[d] Composite result from over 46 samples collected throughout site from zero to 24 feet below surface.

[e] Composite result from three samples collected from the channel.

References

Texas Commission on Environmental Quality (TCEQ). 2001. RG-263: Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas. Austin, Texas. 2001

U.S. Environmental Protection Agency (EPA). 1996. National Sediment Inventory, Appendix D – Screening Values for Chemicals Evaluated. Washington, D.C. 1996.

APPENDIX 2.C

Analysis of Turbidity in the Vicinity of the PALNG Project

Report prepared by: Michael Davies, Ph.D., P.Eng.
15 February 2005
v2.0

Analysis of Turbidity in the Vicinity of the Port Arthur LNG Project

Summary

The brief analysis undertaken herein indicates that the proposed dredging activities for the Port Arthur LNG terminal are unlikely to have extensive adverse effects in the Port Arthur Canal or in Keith Lake. Proposed dredging activities at Keith Lake Cut and in all but the lowest reaches of Sabine Lake do have the potential to generate turbidity levels above background concentrations. However the ambient turbidity levels in the water (generated by flows, waves and ship traffic) create a high background level of turbidity thereby reducing the relative impact of dredging-related turbidity. The work in Keith Lake Cut is also part of restoration work planned for Keith Lake Cut, which will be designed to benefit Keith Lake Cut and Keith Lake, as well as the surrounding marsh.

Project Overview

Pacific International Engineering PLLC (PI Engineering) has been contracted by TRC to undertake a preliminary analysis of turbidity generation from dredging activities related to the terminal and pipeline for the Port Arthur LNG project. This document summarizes the conditions in the area as they relate to turbidity issues and provides an estimate of the levels of turbidity likely to be generated and the areas of the channel and lakebeds to be affected.

The proposed terminal area and pipelines are shown in the following figures from TRC (Figure 1and Figure 2):

Site Descriptions

The study incorporates four distinct areas as shown in Figure 3:

- Sabine Lake
- The Port Arthur Canal, forming part of the Sabine-Neches Waterway (SNWW)
- The Keith Lake Cut (or Keith Lake Fish Passage)
- Keith Lake

Figure 3 Satellite image of study area (Source: Terraserver)

Sabine Lake

Sabine Lake is approximately 16.5 miles long and 6 miles wide with an average depth of 6 to 8 feet. The proposed pipeline would traverse the long axis of the lake covering a distance of about 16 miles.

Sabine Lake receives discharge from the Neches and Sabine rivers, as well as from local watersheds and discharges into the Gulf of Mexico via Sabine Pass. The estuary contains the second-largest freshwater marsh along the Texas coast, the largest salt marsh, and the largest bottomland hardwood swamps. The marsh production provides a major source of organic material supporting the estuary... Anecdotal

evidence from TPWD (Texas Parks and Wildlife Department) Coastal Fisheries monitoring teams suggests that the side of Sabine Lake bordering Louisiana marshes is biologically richer than the Texas side. Therefore it may be that marsh production is more important to Sabine Lake productivity than is material or nutrients brought in by Sabine and Neches Rivers. [1]

The routing of the pipeline to the northern side of the lake, combined with the prevailing southerly winds, helps ensure that dredging activities will have minimal negative impacts on the Louisiana marshes side of the lake.

Port Arthur Canal

The proposed LNG terminal site is located on the west bank of the Port Arthur Canal immediately north of the Keith Lake Cut. The canal here is typically about 1000 ft wide within which is a ship channel 500 ft wide by 40 ft deep. Ambient velocities in the canal are of the order of 1 ft/sec. Ship-generated hydrodynamics are responsible for strong nearshore currents, erosion and sediment suspension (Maynord, 2003, PI Engineering, 2004). Nearshore currents due to ship passage can be as high as 15 ft/sec. The proposed terminal and berthing facilities require 6.7 million yd^3 of dredging – this will be conducted using a 30" cutterhead suction dredge. Dredged materials are to be placed in containment cells near the terminal site. Figure 4 shows typical background turbidity levels and sediment suspension due to ship wakes in the vicinity of the proposed terminal site.

[1] Fang, X., Brock, D. and Sharifuzzaman, M. (2001) Nutrient Transport And Water Quality Monitoring In Sabine Lake Bayous, XXIX IAHR Congress, Sept. 16-21, 2001. Beijing, China.

Figure 4 Ship traffic and turbidity in the Port Arthur ship canal

Keith Lake

Keith Lake is approximately 3 miles long and 1 mile wide with an average depth of about 5 feet. The proposed pipeline would cross the eastern edge of the lake covering a distance of about 0.6 miles.

Keith Lake Cut (or Keith Lake Pass)

This is an enlarged channel connecting Keith Lake to the Port Arthur Canal. The channel is 0.7 miles long, 600 ft wide and between 8 and 20 ft deep. Tidal currents are relatively strong in the channel with peak velocities of up to 3 ft/sec. These tidal currents have caused a deepening and widening of the pass resulting in increased salinity in Keith Lake.

Figure 5 is a color air photo of the Keith Lake Cut showing a turbid plume of sediment entering the cut from the Port Arthur Canal during flood tide conditions – this illustrates the high background turbidity levels presently brought in to Keith Lake via the Keith Lake Cut.

Figure 5 Air photo of Port Arthur Canal and Keith Lake Cut

Hydrodynamic Conditions

A comprehensive assessment of the current, tidal, wind and wave conditions in the study area would include numerical modeling and field data collection. The preliminary assessment being undertaken in the present study has relied simply on available field measurements and observations to provide a cursory overview of the range of meteorological and oceanographic conditions in the study area. This interpretation has included evaluation of river and tidal currents at 5 locations within Sabine Lake to examine the spatial variations in sediment mobility and plume fate. The roles of winds, waves, wind-driven circulation, tidal and river flows have been combined on the basis of their frequency of occurrence in order to predict the likely sediment mobility and erosion levels in the study area. The flow patterns at these 5 sites have also been used to predict trajectories of suspended sediments from dredging activities.

Currents

Currents in Sabine Lake are a result of the combined effects of tides, wind-driven circulation and the inflows of the Sabine and Neches Rivers. The Sabine River has a mean discharge of 13,000 cfs into

Lake Sabine, while the Neches River has a mean discharge of 2,000 cfs. The central portion of Sabine Lake is 6 miles wide and has an average depth of about 8 feet. The average river-generated velocity in the river can therefore be computed to be 0.06 ft/sec. At the upper and lower limits of the lake, its width reduces to about 1.7 miles yielding an average flow speed of about 0.2 ft/sec.

The US Army Corps of engineers, as part of the Sabine-Neches Waterway study (USACE, 2001) gathered salinity and current data in both upper and lower Sabine Lake. Relevant measurement locations along with plots showing some of the current data from this report are provided in Figure 7 and Figure 8. This data shows typical flow velocities at the upper and lower ends of Sabine Lake are as follows:

- Upper site: Mean -0.2 ft/sec, range: 0.5 to -1.2 ft /sec (negative = southward)
- Lower location: Mean -0.2 ft/sec, range: +1.75 to -2 ft /sec.

These mean velocities are in reasonable agreement with the ballpark estimates computed in the preceding section using cross-sectional areas and river discharges. Measured flow velocities were used to predict sediment and plume behaviour at the upper and lower ends of Sabine Lake. In the central portion of the lake, river and tidal flows were linearly scaled between the measurements and factored by the cross-sectional area of the lake.

Salinity from the upper lake measurements varies between 0 to 10 ppt, in the lower lake the salinity is higher, ranging from 0 to 28 ppt. Salinity is also high in Keith Lake, ranging from 0 to 22 ppt.

Figure 6 Relevant instrument locations from USACE SNWW study

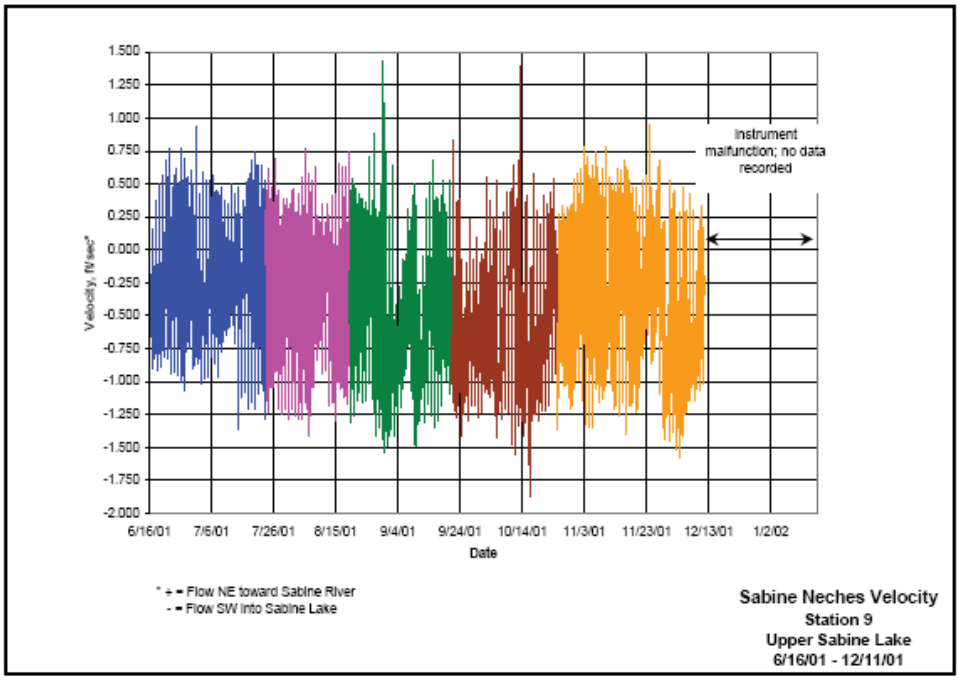


Figure 7 Velocity data records for Station 9 from 6/16/01-12/11/01 (USACE, 2004)

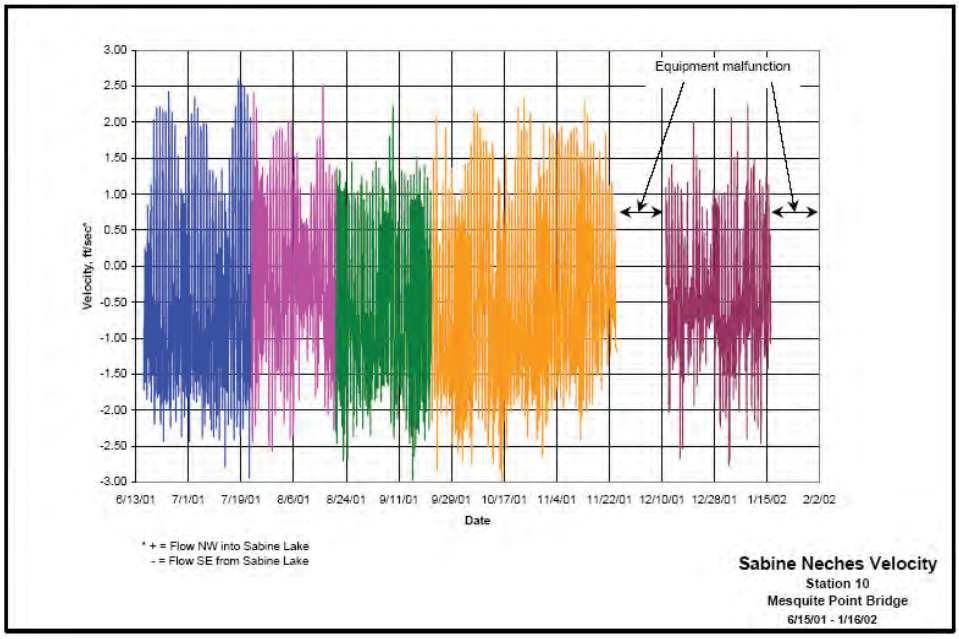


Figure 8 Velocity data records for Station 10 from 6/15/01-1/16/02 (USACE, 2004)

Flow velocities in the Keith Lake Cut measured during a 1996 field campaign conducted by the Texas Water Development Board (TWB, 1996) are shown in Figure 9. Here it can be seen that for the 1990 data the mean velocity is approximately 0 while peak flood and ebb flows being roughly 1 m/sec in both directions. The 1996 data is more sparse and indicates peak flow speeds of about 0.8 m /sec and a net velocity toward the east.

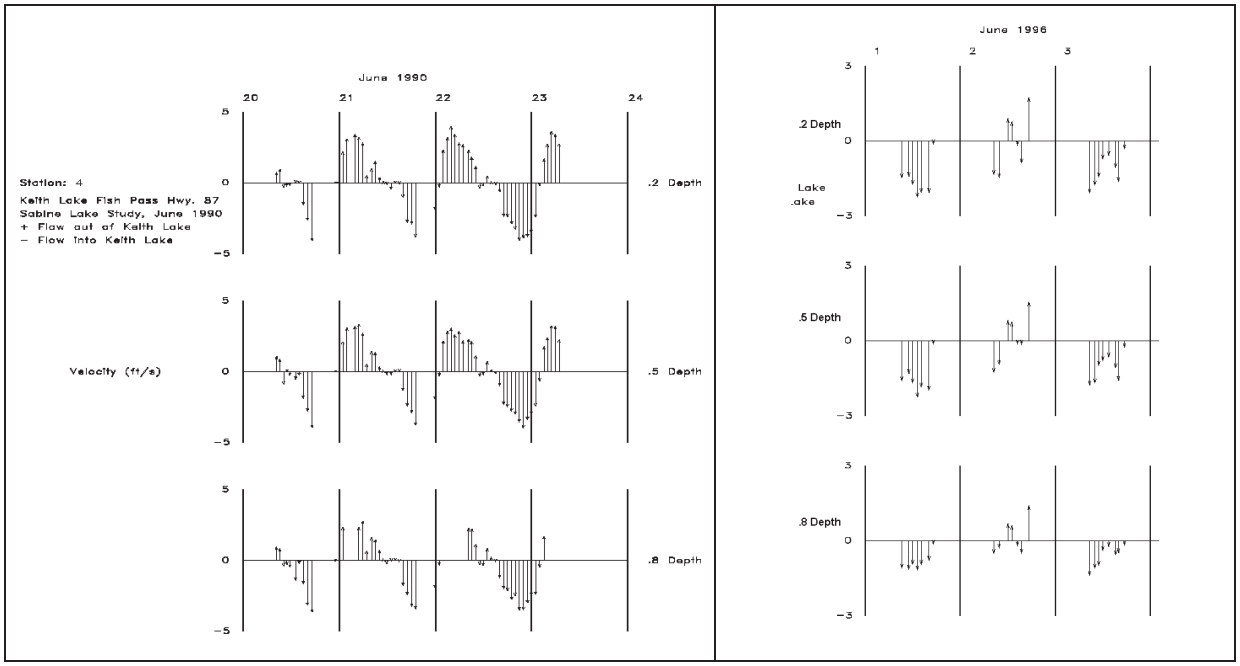


Figure 9 Velocity measurements from Keith Lake Cut, (TWDB 1900 and 1996)

The Texas General Land Office measured tidal currents along the Sabine-Neches Channel at the entrance to Keith Lake Cut in May 2001. These measurements were taken as part of a feasibility study focused on the hydraulics of the Keith Lake system. Current velocities were measured along transects and in the middle of the water column to obtain depth-averaged velocities. A maximum current speed of 50 cm/sec (1.64 ft/sec) was measured on May 19, 2001. However, calibrated modeling results show currents speeds can be as high as 70 cm/sec (2.29 ft/sec) at the entrance to Keith Lake Cut in the Sabine-Neches Waterway.

Winds

Wind effects were considered in terms of the wind-driven circulation of water in Sabine Lake as well as the effects of wind-generated waves. A statistical analysis of wind data from Port Arthur has been conducted. The resulting wind speed histogram is shown in the following figure.

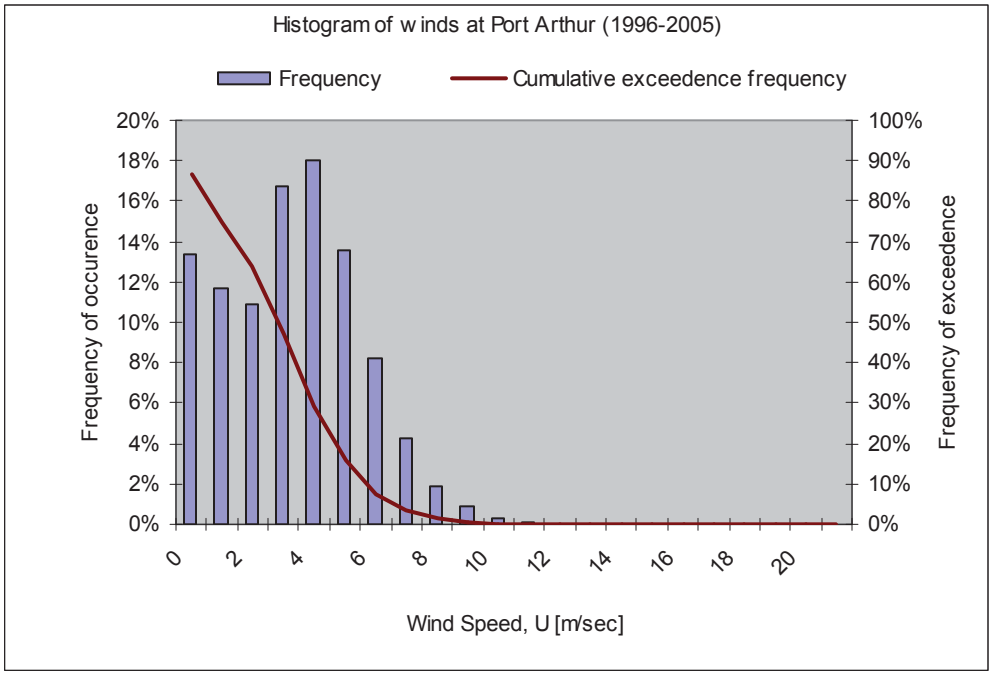


Figure 10 Winds in the area range average 3.35 m/sec with 10% exceedance level of 6m/sec and 1% exceedence level of 9m/sec

From these wind statistics, the following three wind criteria are selected:

- 50% exceedance level wind, U=3.35 m/sec;
- 10% exceedance level wind; U=6 m/sec; and
- 1% exceedance level wind, U=9 m/sec.

A good rule-of-thumb is that wind-driven circulation velocities are 3% of the hourly averaged windspeed. Using this relationship, these wind speeds correspond to wind-driven circulation velocities of 0.1, 0.02 and 0.3 m/sec respectively. It is interesting to note that these wind-driven currents are the same order of magnitude as the river discharge generated currents.

Since water depths and wind patterns are reasonably similar between Sabine Lake and Keith Lake, wind-generated currents in Keith Lake are assumed to be roughly similar to those in Sabine Lake.

A simplified characterization of the winds which in a piece-wise manner fits the above wind distribution is as follows:

- 25% of the time U=1 m/sec
- 25% of the time U=3 m/sec
- 25% of the time U=4.5 m/sec
- 25% of the time U=6 m/sec

The directional distribution of wind speeds at Port Arthur is summarized in the wind rose presented in Figure 11.

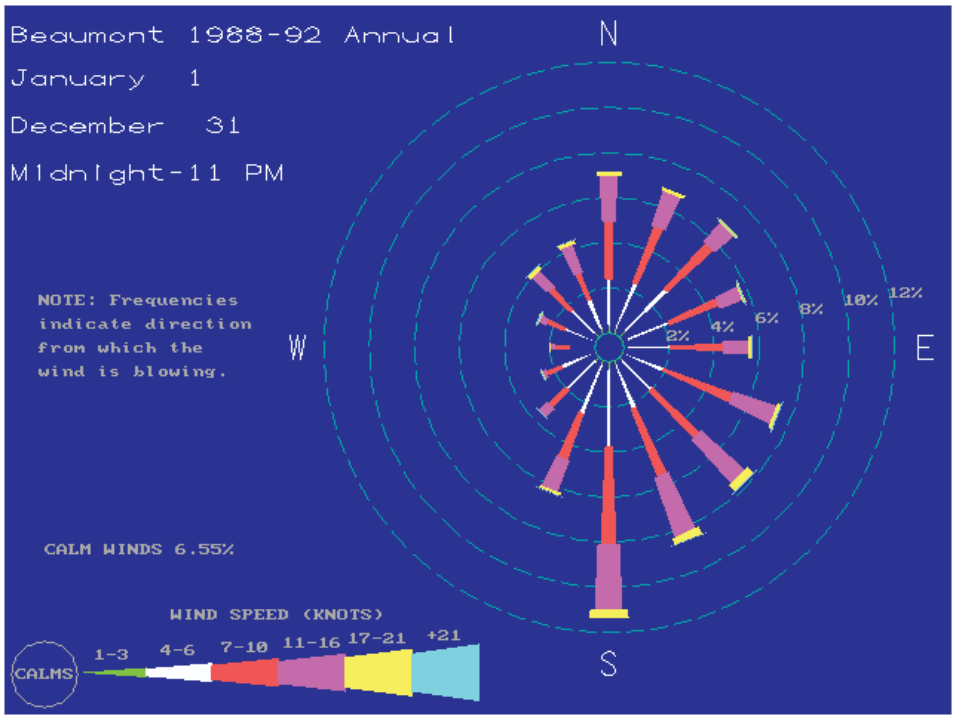


Figure 11 Wind rose for Port Arthur, Tx
(www.tceq.state.tx.us/assets/public/compliance/monops/air/windroses)

Waves

Fetches vary with location in the lake and with wind direction. Nominally, fetches vary from 3 to 12 km. There is a 7 km fetch for winds coming across Sabine Lake from the SE. A matrix of wave conditions has been developed using the SMB-shallow water wave hindcasting technique for each of the 4 quartile wind speeds using a 8-point compass. Table 1 provides a breakdown of the frequency of occurrence of the quartile windspeeds by direction for each of 5 stations distributed along the Sabine Lake pipeline route. Figure 12 shows the locations of the 5 stations.

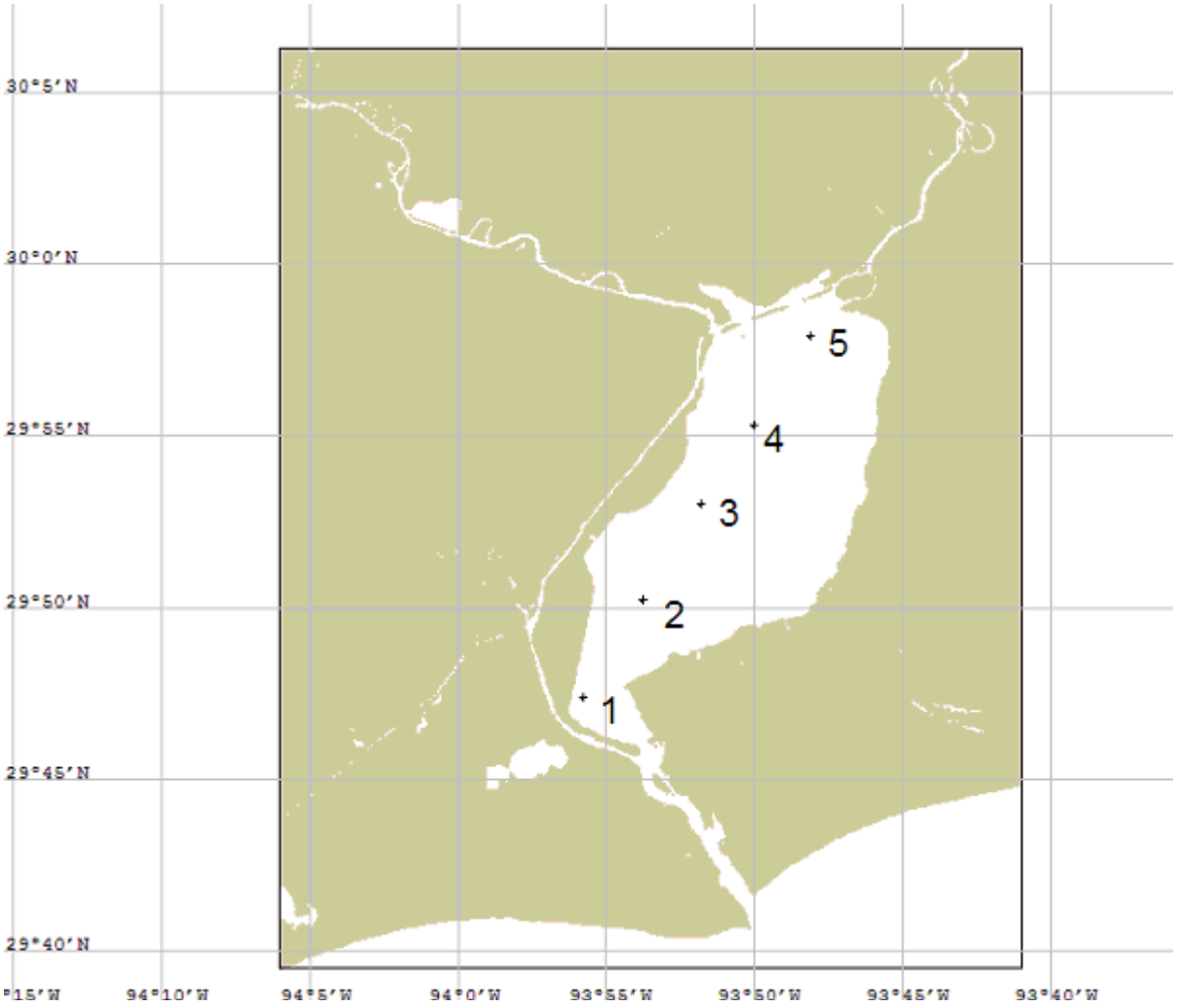


Figure 12 Five analysis stations along the Sabine Lake pipeline

Table 1 Frequency of occurence of quartile wind speeds used in analysis

Wind speed [m/sec]	Frequency of occurrence by direction							
	N	NE	E	SE	S	SW	W	NW
6.5	4.1%	2.6%	3.1%	5.2%	5.2%	2.1%	0.2%	2.6%
4	2.8%	3.5%	4.1%	4.2%	5.3%	1.8%	1.4%	1.8%
3	3.2%	3.8%	3.1%	3.1%	4.6%	3.1%	1.9%	2.3%
1	3.2%	3.8%	3.1%	3.1%	4.6%	3.1%	1.9%	2.3%

Using these windspeeds and directions, the SMB hindcasting technique was used to predict the wave height matrix shown in Table 2.

Table 2 Wave conditions - Sabine Lake

Station	Wind speed [m/sec]	H_s [m] N	NE	E	SE	S	SW	W	NW
1	Fetch:	3000 m	21000 m	3000 m	4000 m	1400 m	1000 m	500 m	500 m
	6.5	0.17	0.31	0.17	0.19	0.12	0.10	0.07	0.07
	4	0.11	0.21	0.11	0.12	0.07	0.06	0.05	0.05
	3	0.08	0.16	0.08	0.09	0.06	0.05	0.03	0.03
	1	0.02	0.03	0.02	0.02	0.02	0.01	0.01	0.01
2	Fetch:	5000 m	17000 m	9000 m	4000 m	4000 m	6000 m	3000 m	4000 m
	6.5	0.21	0.30	0.25	0.19	0.19	0.22	0.17	0.19
	4	0.13	0.20	0.16	0.12	0.12	0.14	0.11	0.12
	3	0.10	0.15	0.12	0.09	0.09	0.11	0.08	0.09
	1	0.02	0.03	0.03	0.02	0.02	0.03	0.02	0.02
3	Fetch:	6000 m	13000 m	9000 m	8000 m	8000 m	10000 m	3000 m	2000 m
	6.5	0.22	0.28	0.25	0.24	0.24	0.26	0.17	0.14
	4	0.14	0.18	0.16	0.16	0.16	0.17	0.11	0.09
	3	0.11	0.14	0.12	0.12	0.12	0.13	0.08	0.07
	1	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
4	Fetch:	6000 m	8000 m	6500 m	7200 m	10500 m	18000 m	4000 m	3500 m
	6.5	0.22	0.24	0.23	0.23	0.26	0.30	0.19	0.18
	4	0.14	0.16	0.14	0.15	0.17	0.20	0.12	0.11
	3	0.11	0.12	0.11	0.11	0.13	0.15	0.09	0.08
	1	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
5	Fetch:	2000 m	2000 m	4000 m	5000 m	15000 m	23000 m	5000 m	2000 m
	6.5	0.14	0.14	0.19	0.21	0.29	0.31	0.21	0.14
	4	0.09	0.09	0.12	0.13	0.19	0.21	0.13	0.09
	3	0.07	0.07	0.09	0.10	0.14	0.16	0.10	0.07
	1	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02

Sediments

The following characterization of soil conditions in the area was provided to PI Engineering by TRC:

> Sediment texture analysis was performed on surficial sediments from select stations (Barry A. Vittor & Associates,

Inc., 1997) as part of a larger survey of potential ecotoxicological effects in Sabine Lake sediments (Long, 1999). The survey encompassed an area of approximately 246 km and included sediment texture analysis of 22 samples from Sabine Lake, the Neches and Sabine Rivers, the Intracoastal Waterway, and Sabine Pass – see Figure 13).

Sediments in Sabine Lake are typical of estuaries in the northwestern Gulf, with variable amounts of sand, silt, and clay. As shown in Table 3, sediment composition at the 22 stations varied considerably, from 96.4% sand at station 1 to 66% clay at station 66; however, sediments at all stations except 1, 22, 37, 45, and 56 were dominated by the silt/clay fraction, mostly classified as silty clay or clay (Barry A. Vittor & Associates, Inc., 1997). Sediments at most stations within the lake tended to have greater sand percentages than stations in the rivers and the Sabine-Neches Canal. The total organic carbon (TOC) fraction was uniformly low and ranged from 0.38% at Station 50 to 3.88% at Station 1.

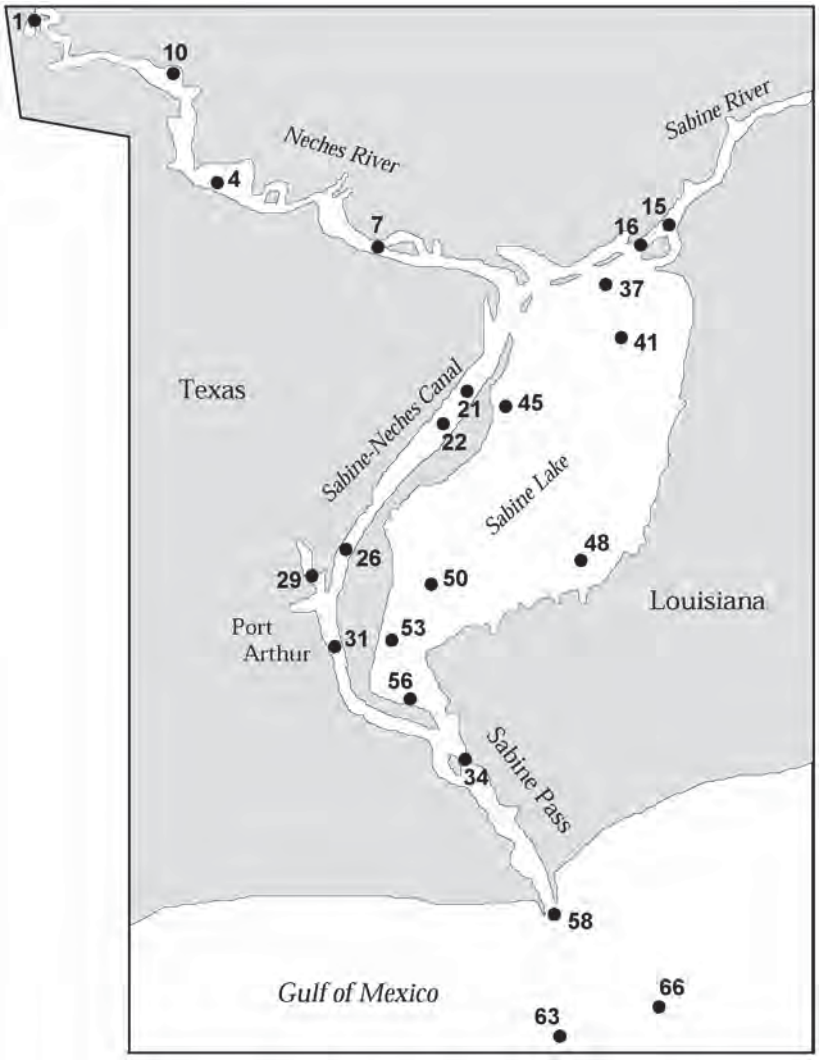


Figure 13 Station locations for sediment analysis : Sabine Lake, August 1995 (Adapted from Long, 1999)

Table 3 Sediments – Sabine Lake

Summary of sediment data for Sabine Lake stations, August 1995 (source: Barry A. Vittor & Associates, Inc., 1997).						
Station	% Gravel	% Sand	% Silt	% Clay	TOC	Textural Description
1	0.49	96.40	0.61	0.00	1.26	sand
4	0.00	16.59	35.16	48.25	3.88	silty clay
7	0.00	10.26	34.64	55.10	3.56	clay
10	0.00	7.59	41.28	51.13	2.46	clay
15	0.00	4.57	53.96	41.47	2.44	silty clay
16	0.00	8.81	45.50	45.69	2.78	silty clay
21	0.00	6.97	44.46	48.57	2.96	silty clay
22	0.00	69.93	21.48	8.58	0.95	silty sand
26	0.00	10.14	42.26	47.60	2.08	silty clay
29	0.00	5.13	36.38	58.48	2.48	clay
31	0.00	3.12	45.50	51.38	2.18	clay
34	1.03	29.46	30.78	38.73	2.43	sandy clay
37	0.07	68.54	24.85	6.54	0.95	silty sand
41	0.13	26.54	48.27	25.06	2.13	clayey silt
45	0.03	69.05	25.29	5.63	0.95	silty sand
48	0.00	23.43	52.00	24.57	1.43	clayey silt
50	0.03	49.26	36.68	14.03	0.38	silty sand
53	0.00	44.38	38.44	17.18	1.54	sandy silt
56	1.46	59.71	24.72	14.10	0.90	silty sand
58	0.00	4.12	52.08	43.80	1.90	silty clay
63	0.00	4.49	39.72	55.79	2.15	clay
66	0.00	1.19	32.41	66.39	1.73	clay

For assessing the behavior of fines, the two identifying ranges are the proportion of material finer than 64μm (silts) and that finer than 4 μm (clays). From the Vittor and Associates dataset we can assume that soils encountered during the dredging operation will range from 25 to 50 % silt and 5% to 25% clay. The level of organics combined with the high fines contents of these soils will likely make them highly mobile and susceptible to suspension during dredging activities. Salinity levels in the study area are generally above 3ppt making these soils susceptible to flocculation – hence fall velocities in the range of 0.1 to 0.5 mm/sec can be anticipated.

Based on the range of sediment sizes in the area and the possibility of flocculation due to the salinity levels, a range of sediment fall velocities and shear thresholds has been developed as shown in the following table. Without direct site sampling a wide range of possible conditions must be considered. For a preliminary scoping assessment, the following sediment characteristics have been assumed:

- Specific gravity, SG=1.9
- Critical shear stress for erosion, τ_c=0.2 Pa
- Fall velocity, w= 0.5 to 0.1 mm/sec

- Wave friction factor, f_w=0.01
- Current friction factor, f_c=0.01

Dredging volumes, rates and plume generation:

The dredging activities under consideration here have been broken down into 4 areas:

1. The dredging and backfilling of a pipeline trench approximately 16 miles long across Sabine Lake;
2. The dredging, sidecasting and backfilling of a similar pipeline trench approximately 0.6 miles long across Keith Lake;
3. Keith Lake Cut; and,
4. Suction cutterhead dredging of the terminal area.

Turbidity and TSS Thresholds

The relationship between turbidity and TSS is discussed in an EPA Region 6 report "TMDL for suspended solids and turbidity for English Bayou in the Calcasieu River Basin" (EPA, 2002). In their report a TMDL standard of 50 NTU for turbidity and 24 mg/L for TSS is established. For waters where the background turbidity level exceeds 50 NTU, NTU by any discharges shall be restricted to the appropriate background level plus 10%.

High turbidity levels can adversely affect the growth of marine vegetation largely due to reduced light levels. The Australian EPA (2001) has studied the effects of light attenuation on seagrass survival and developed a turbidity criteria of 5 NTU as the threshold for onset of damage to seagrass beds due to dredging. It is worth noting that turbidity levels throughout the Sabine-Neches Waterway are typically much higher than 5 NTU (typically of the order of 40 NTU or higher). Since the background turbidity levels exceed this threshold it is unlikely that dredging activities would have a detrimental effect throughout much of the study area.

Sediment release rates

The cut, sidecast and backfill operations proposed for the bulk of the dredging to be undertaken in both Keith Lake and Sabine Lake can be

expected to generate large sediment releases due to the following processes [2]:

- Impact of the bucket on the bed;
- Disturbance of the bed during initial removal of the bucket;
- Material spilled and washed from the bucket during hoisting;
- Leakage and dripping during slewing;
- Sediment plume generation during dumping (sidecasting);
- Disturbance of bed during sidecasting deposition;
- Washing of residual adhering material during lowering;
- Sediment disturbance during placement of pipeline
- Repetition of the first 7 processes will occur as sidecast material is replaced in the pipeline trench.

Sediment resuspension caused by backhoe dredging is greatly dependant on operator skill. Mitigation measures include limiting swinging of the bucket over open water thereby reducing the time when sediment can leak and not smoothing the excavated area by dragging the backhoe bucket along the seabed. However, sediment resuspension and deposition during dredging is inevitable and it is anticipated that the proposed cut and fill operations will result in significant turbidity plumes and sediment redistribution. The construction technique for the pipeline placement is shown schematically in Figure 14. If the dredge spoils are cast on the upwind side of the trench (typically the south-east side), the dredging area will become partially sheltered by the combination of the dredge spoils and the various construction barges – thereby reducing currents and wave disturbance in the immediate vicinity of the dredge. This could result in a reduction in turbidity levels due to the dredging operations.

A large uncertainty in any dredging analysis is the actual suspended sediment loss rate that will occur. A few published reports on the rate of generation of suspended solids during dredging operations are presented in the following:

Working in shallow water with a backhoe dredge, sediment loss rates of 6% for dredging and 10% for dumping were assumed for the Baltic Pipeline project (Ref: DONG, 2001).

Pennekamp et at (1996) reported source rates of suspended sediment of 8 to 15 kg/m^3 for suction hopper dredges and a rate of 54 kg/m^3 for

[2] Adapted from: John, SA, Challinor, SL, Simpson, M, Burt, M and Spearman, J (2000). Scoping assessment of sediment plumes from dredging. CIRIA Publication C547.

open backhoe dredging. This is the highest generation rate of any of the methods reviewed by Pennekamp et al; most other mechanical dredging techniques (clamshells and bucket dredges) were seen to have source rates of between 3 and 20 kg/m3.

Hayes and Wu (2001) report that on the basis of almost 400 samples from cutterhead dredge operations that a large cutterhead can be expected to have a loss rate of 0.1%.

Figure 14 Schematic of pipeline placement method in Sabine Lake and Keith Lake

Table 4 Suspended sediment production from various dredging methods (EPA 1994)

TABLE 4-12. SUSPENDED SOLIDS CONCENTRATIONS PRODUCED BY VARIOUS DREDGES

Dredge Type	Suspended Solids Concentration	Remarks
Cutterhead		
10 rpm	161 mg/L (sandy clay), 52 mg/L (medium clay)	Observations in the Corpus Christi Channel (Huston and Huston 1976)
20 rpm	187 mg/L (sandy clay), 177 mg/L (medium clay)	
30 rpm	580 mg/L, 266 mg/L	
18 rpm	1–4 g/L within 3 m of cutter	Soft mud at Yokkaichi Harbor, Japan (Yagi et al. 1975)
18 rpm	2–31 g/L within 1 m of cutter	
Trailing suction (hopper dredge)	Several hundred milligrams per liter at overflow	San Francisco Bay (Barnard 1978)
	2 g/L at overflow 200 mg/L at 200 m behind pump	Chesapeake Bay (Barnard 1978)
Mudcat	1.5 m from auger, 1 g/L near bottom (background level 500 mg/L) 1.5–3.5 m in front of auger, 200 mg/L surface and mid-depth (background level 40 to 65 mg/L)	
PNEUMA* pump	48 mg/L at 1 m above bottom 4 mg/L at 7 m above bottom (5 m in front of pump)	Port of Chofu, Japan
	13 mg/L at 1 m above bottom	Kitakyushu City, Japan
Clean-up	1.1–7.0 mg/L at 3 m above suction 1.7–3.5 mg/L at surface	Toa Harbor, Japan
Grab/bucket/clamshell	Less than 200 mg/L and average 30–90 mg/L at 50 m downstream (background level 40 mg/L)	San Francisco Bay (Barnard 1978)
	168 mg/L near bottom 68 mg/L at surface	100 m downstream at lower Thames River, Connecticut (Bohlen and Tramontaro 1977)
	150–300 mg/L at 3.5-m depth	Japanese observations (Yagi et al. 1975)
Enclosed buckets	30–70 percent less turbidity than typical buckets	Based on comparison of 1-m^3 bucket (Barnard 1978)
	500 mg/L at 10 m downstream from a 4 m^3 water tight bucket	

Source: Herbich and Brahme (1991) except where noted.

Note: **This table serves as a summary of many different studies on the resuspension characteristics of multiple dredge types. The reader should use caution in the use of values presented in this table due to the extremely site-specific nature of sediment resuspension rates.**

The supporting documentation for the Baltic Sea Pipeline (DONG, 2001) provides the following summary of turbidity effects due to dredging activities:

Table 5 Concentration of suspended sediment, sedimentation and sedimentation rates together with environmental impacts (DONG, 2001)

Concentration	Effect
Concentration of suspended matter in Øresund: Winter: 0 – 2 mg/l (periods with wind: 5 – 15 mg/l) Summer: 2 – 4 mg/l (because of phytoplankton)	Normal
Suspended sediment: 2 mg/l	Visible
Suspended sediment: 28 mg/l	Reduction of transparency/visibility into the water column down to 1 meter (bathing water quality criteria, 'Blue flag')
Suspended sediment: 6 - 10 mg/l	Escape reaction of fish
Suspended sediment: 15 mg/l	Effect on foraging of birds
Sedimentation: 60 g/m^2/day	Reduced settling of mussel spat (*Mytilus edulis*) on the seabed
Sedimentation: 240 mm Sedimentation rate: 70 mm/ month	*Macoma Balthica* (No impact on survival)
Sedimentation: 100 mm Sedimentation rate: 23 mm/month	*Corophium volutator* 50% mortality
Sedimentation: 300 mm Sedimentation rate: 23 mm/month	*Mya arenaria* 50 % mortality

Sediment volumes

The following table summarizes the total volume of material to be excavated and re-placed for the various pipeline trenching operations. Volumes are expressed in cubic metres of material as well as estimated daily rates.

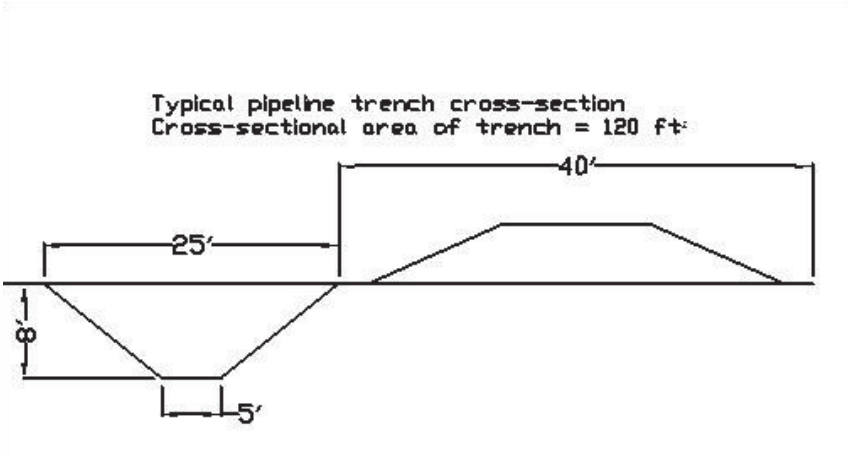


Figure 15 Pipeline trench geometry

Table 6 Dredging and turbidity generation rates

Site	Length of trench	Volume to be excavated	Duration (est.)	Rate (yd^3/day)	Rate (ft/day)	Turbidity Generation (tonnes/day)
Sabine Lake	85,300 ft	379,120 yd^3	90	4,212	950	1493
Keith Lake	3,500 ft	15,556 yd^3	45	345	78	122
Keith Lake Cut	280 ft	1,244 yd^3	2	622	140	220

Turbidity generation rates for open backhoe operations are estimated as a TGU of 54 kg/m^3. For the production rates at Sabine Lake this equates to a suspended sediment source rate of 17 kg/sec. The following figure shows the predicted plume concentrations from the USACE ADDAMS/DREDGE program for these conditions.

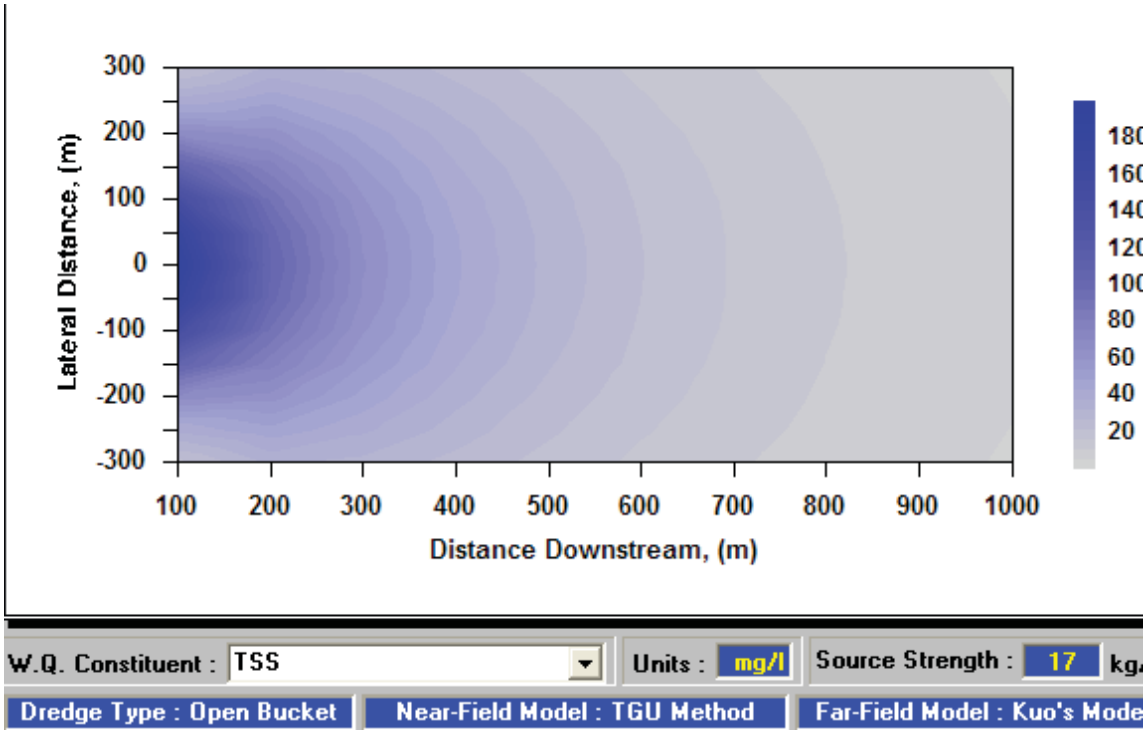


Figure 16 Dredge plume for Sabine Lake (0.1m/sec current, w=0.5mm/sec) using backhoe excavator

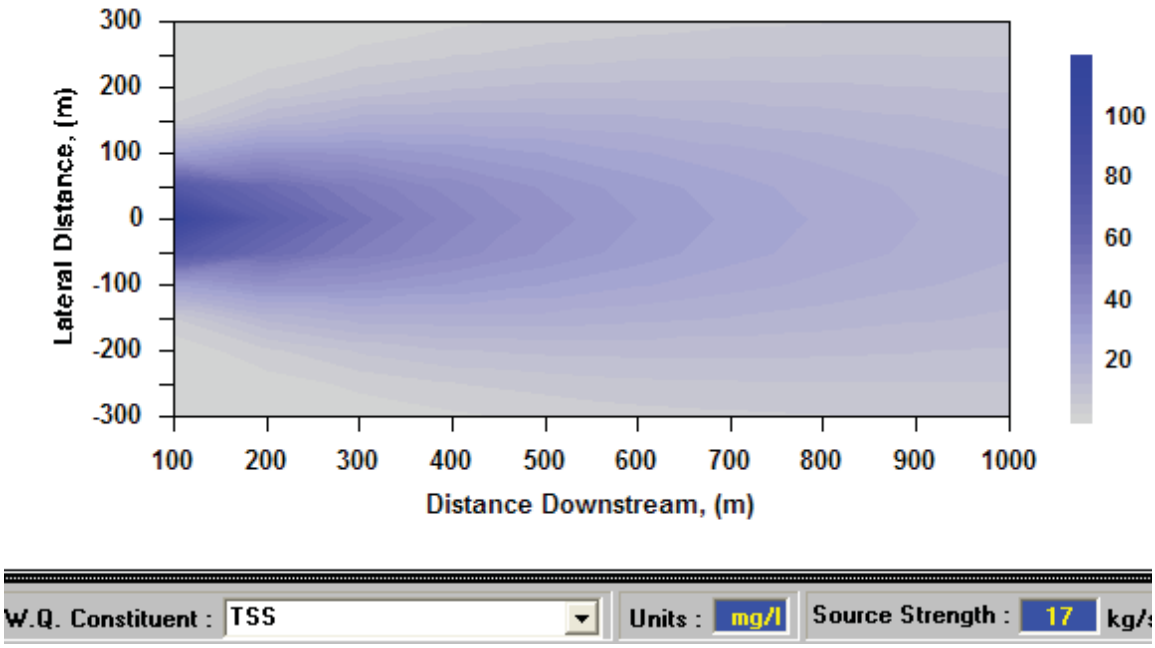


Figure 17 Dredge plume for Sabine Lake (0.5m/sec current, w=0.5mm/sec) using backhoe excavator

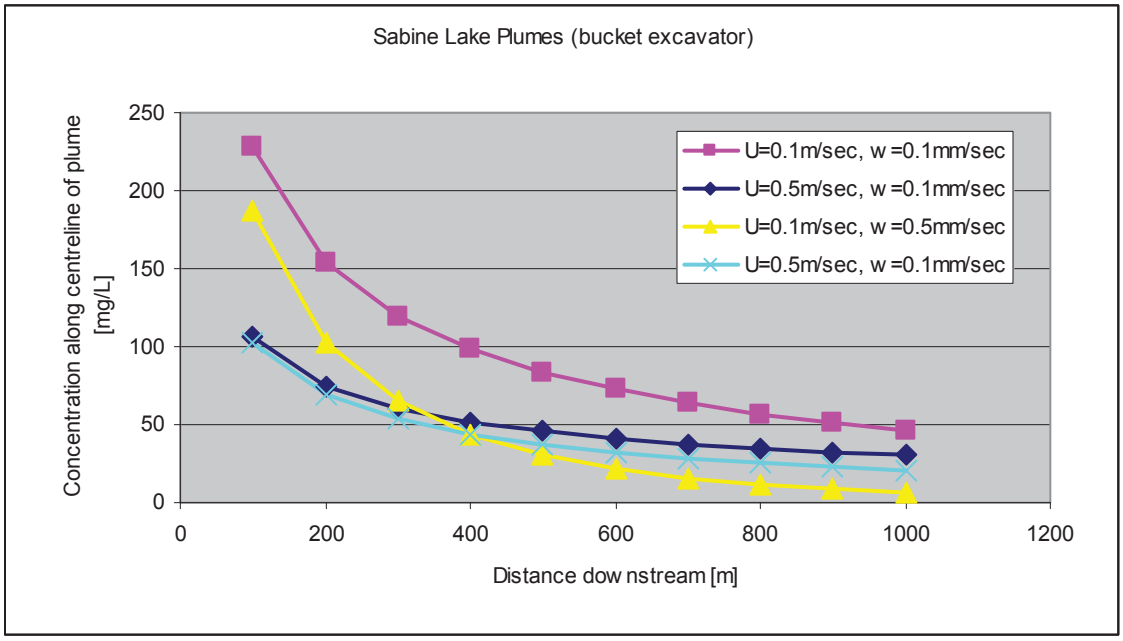


Figure 18 Concentration downstream of source predicted by DREDGE

Considering that 24 mg/L is the Louisiana TSS threshold and that 40mg/L is the mean ambient TSS level in the Port Arthur Canal, it can be seen from the foregoing figures that the critical plume area from the Sabine Lake dredging can be expected to be of the order of 500 m wide and about between 0.5 and 1 km long (varying significantly with actual dredging practices, with sediment characteristics and local currents).

The Keith Lake dredging operation is expected to see significantly lower currents, also dredging rates are significantly lower for the Keith Lake work (approximately 1/10th of the rates in Sabine Lake). Therefore dredge plumes are not expected to exceed 200m in width or length for the Keith Lake operations (see Figure 19)

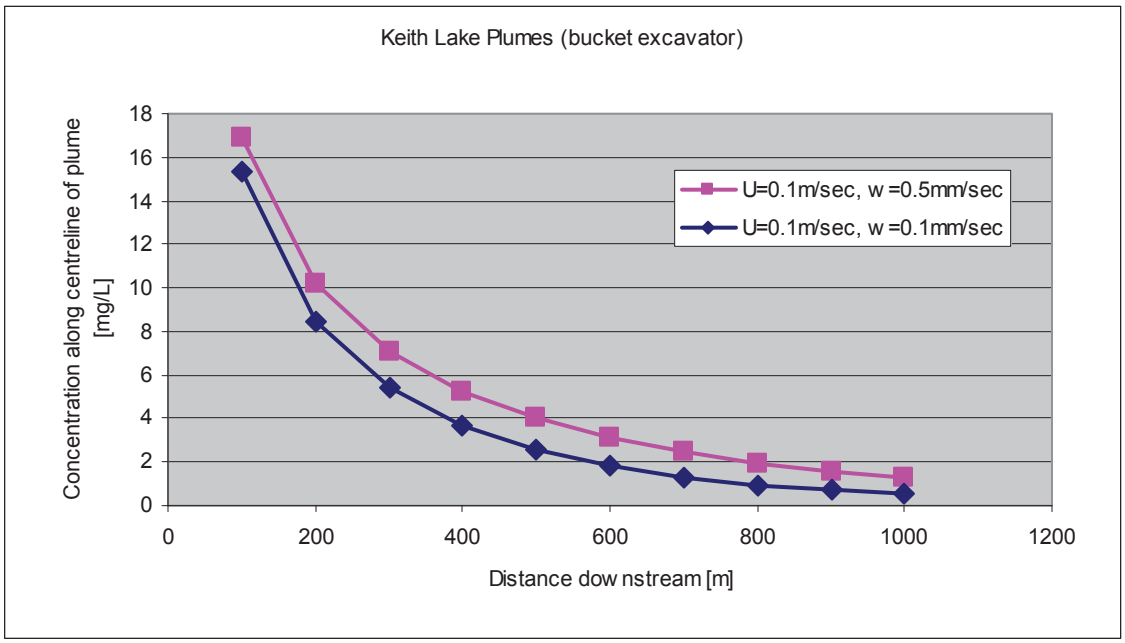


Figure 19 Concentration downstream of plume - Keith Lake

Keith Lake Cut

The Keith Lake Cut has the highest currents in the area, any backhoe excavation work undertaken at Keith Lake Cut can be expected to generate high levels of turbidity that could either be carried into the Keith Lake region (during flood tides) or into the Port Arthur Canal (during ebb tides). Since the tides in the region are diurnal, it may be practical to cease all dredging activities during flood tides. Sediments from dredging which are carried into the Port Arthur Canal during ebb are likely to be carried as far south as the Gulf of Mexico. It is not possible at this stage to make reasonable predictions of the sediment loads or turbidity levels that would be generated – more detailed analysis of both the hydrodynamics of the area and of the mechanics of the dredging operation would be required for an assessment of the turbidity impacts of dredging in the Keith Lake Cut.

In conjunction with the proposed pipeline, the USACE and the Texas Dept. of Fish and Wildlife intends to build a series of riprap weirs (baffles) to reduce salt water intrusion to Keith Lake. It is our understanding that the pipeline will be built directly beneath one of these baffles; the disturbance of the riverbed and associated turbidity

due to dredging for the pipeline will therefore be an integral component of the Keith Lake Fish Pass restoration works.

Frequency-based analysis

A separate analysis of plume dimensions has been undertaken using a simplified trajectory approach. The combinations of wind speeds, directions, tidal currents and river currents at each of the 5 study sites within Sabine Lake have been used to compute the distance, *R* from its source that a sediment particle would travel while falling at its fall velocity over a depth of 2 m.

Plots of the range of sediment trajectories for each of the 5 study sites in Sabine Lake are presented in the following figures.

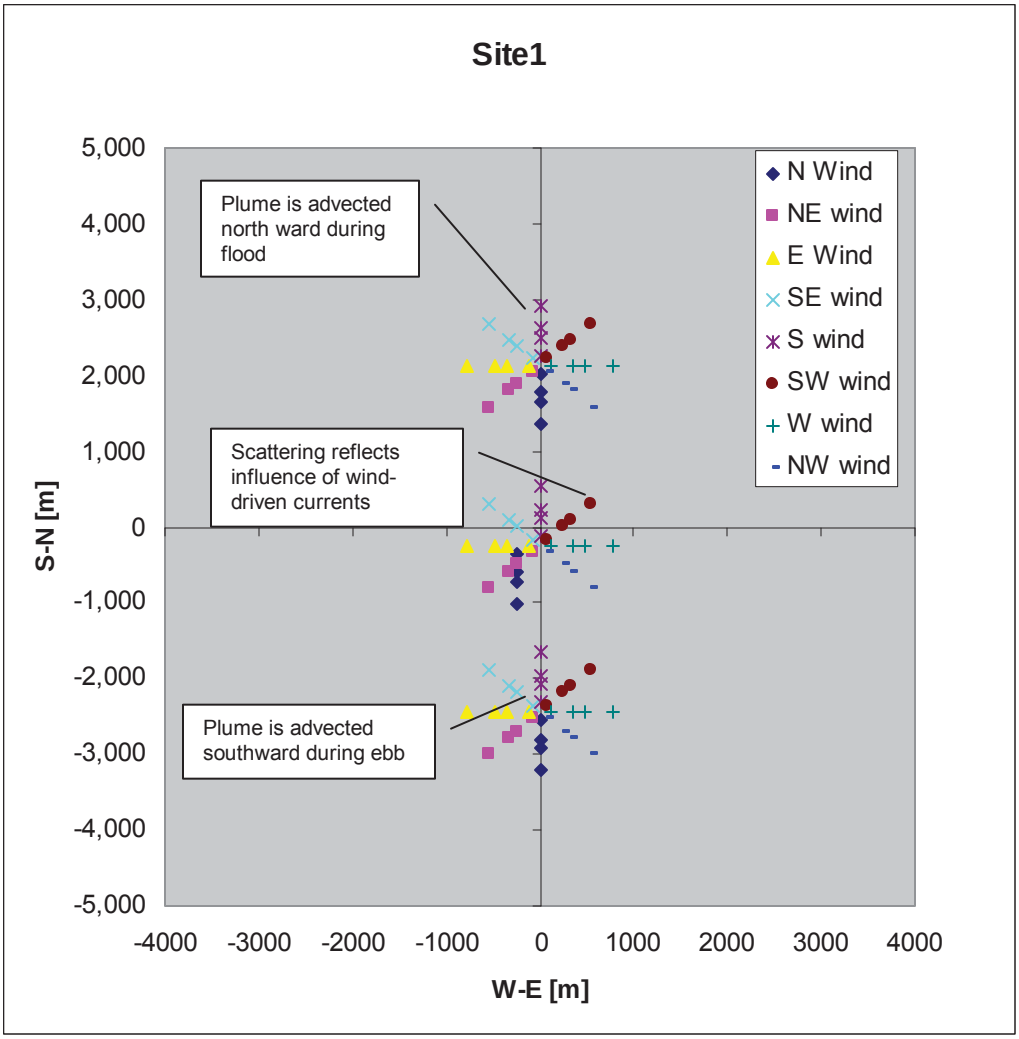


Figure 20 Plume extents predicted by trajectory analysis at Site 1

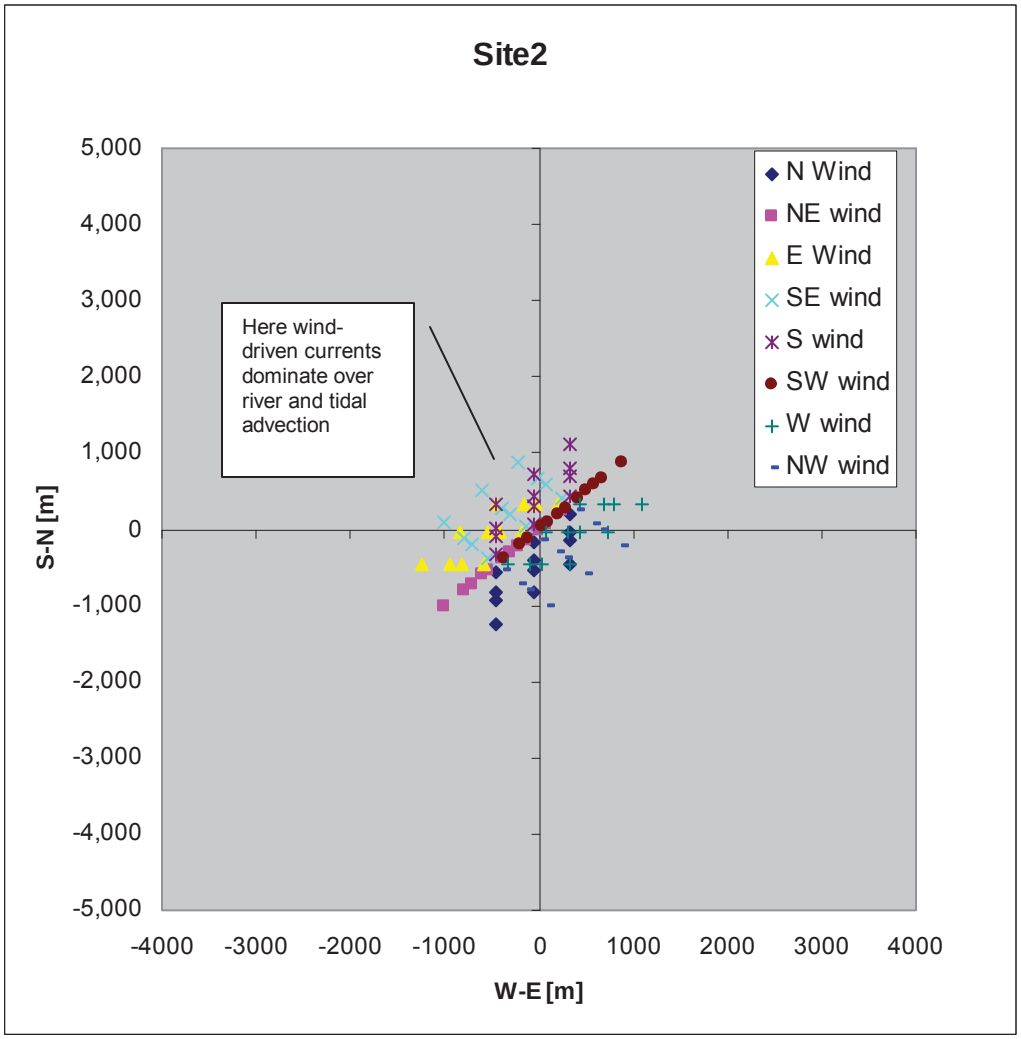


Figure 21 Plume extents predicted by trajectory analysis at Site 2

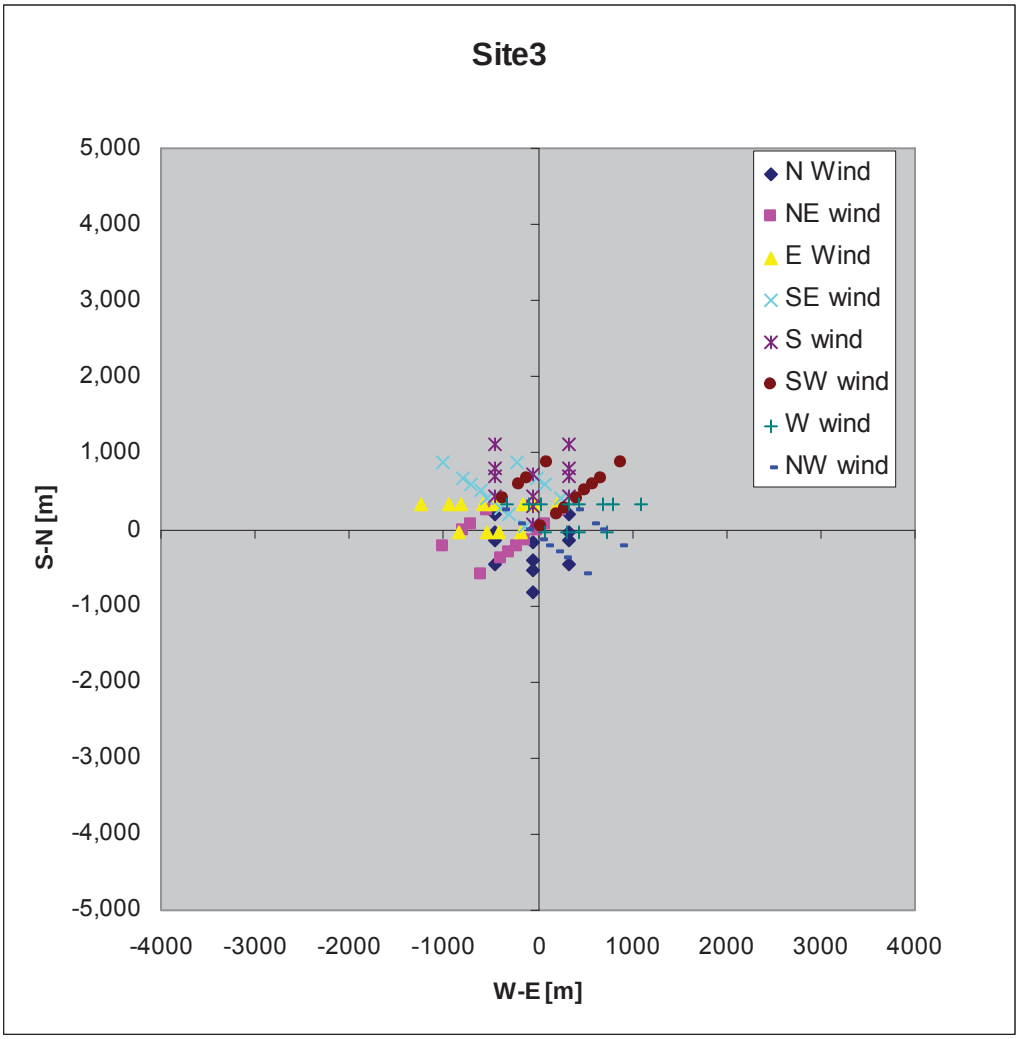


Figure 22 Plume extents predicted by trajectory analysis at Site 3

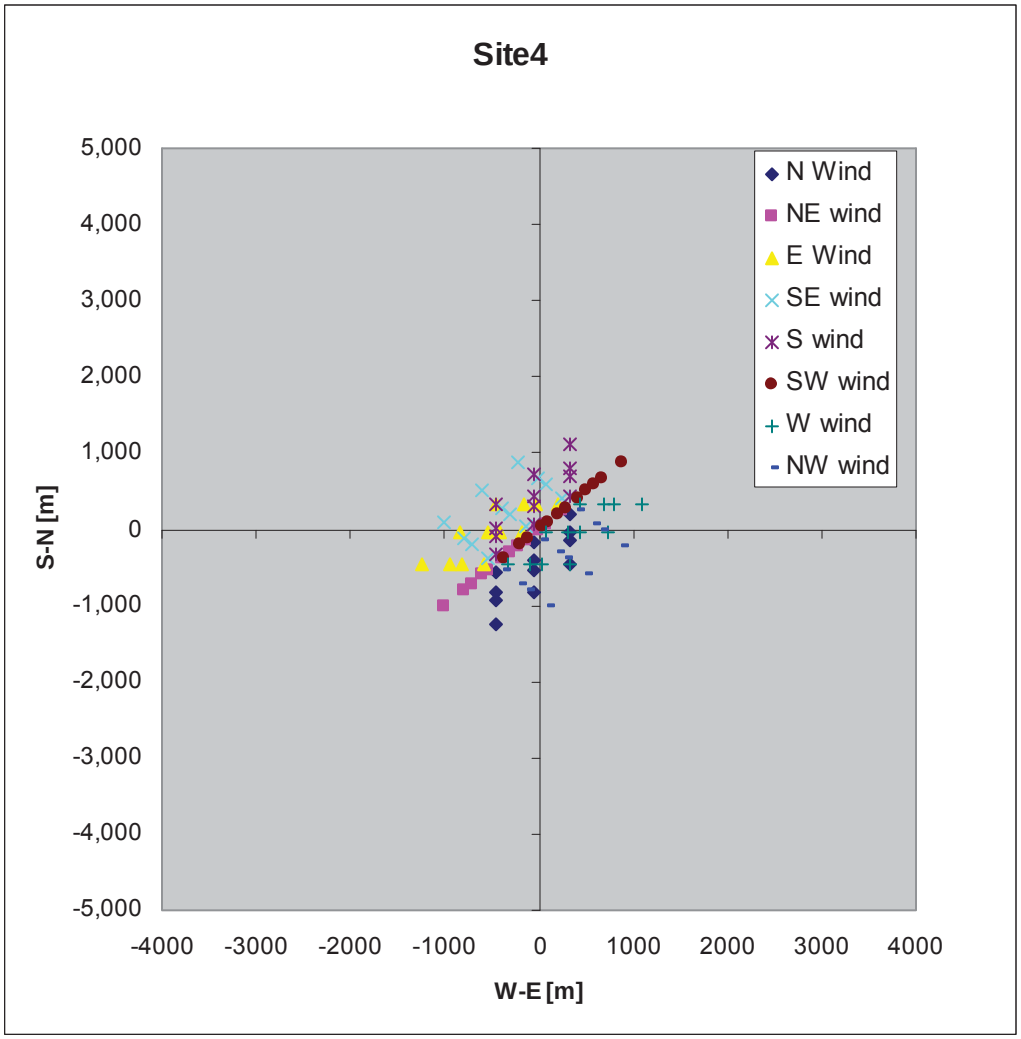


Figure 23 Plume extents predicted by trajectory analysis at Site 4

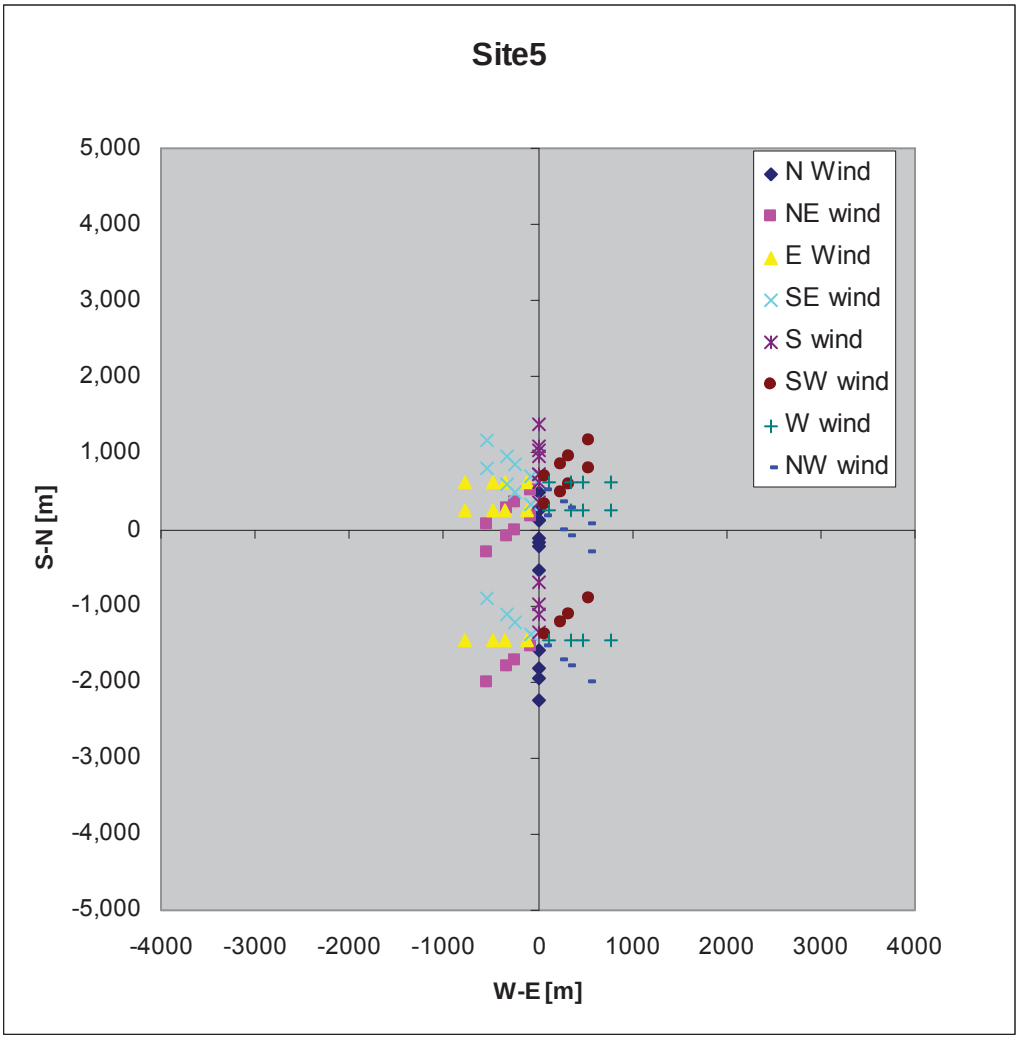
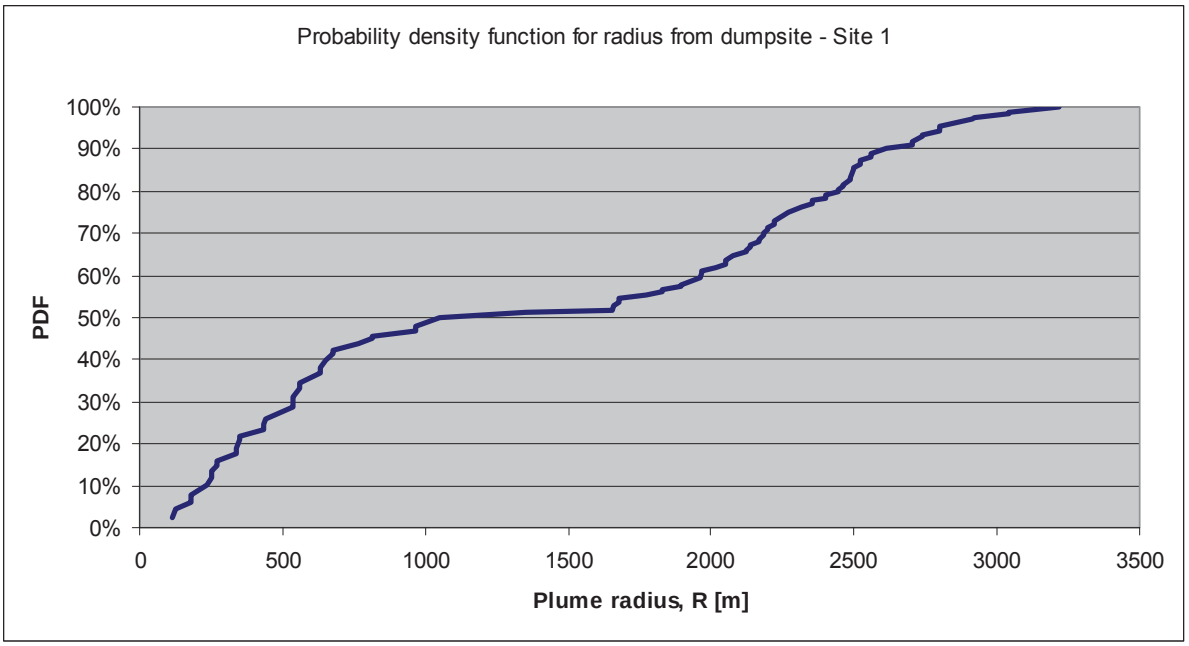
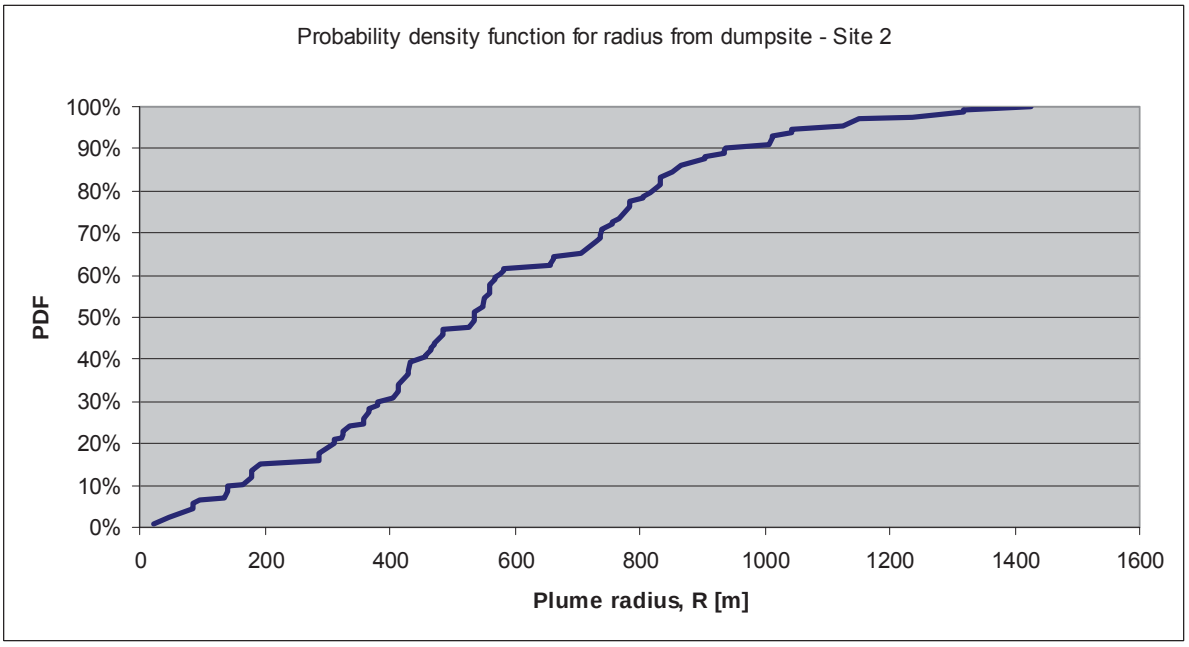
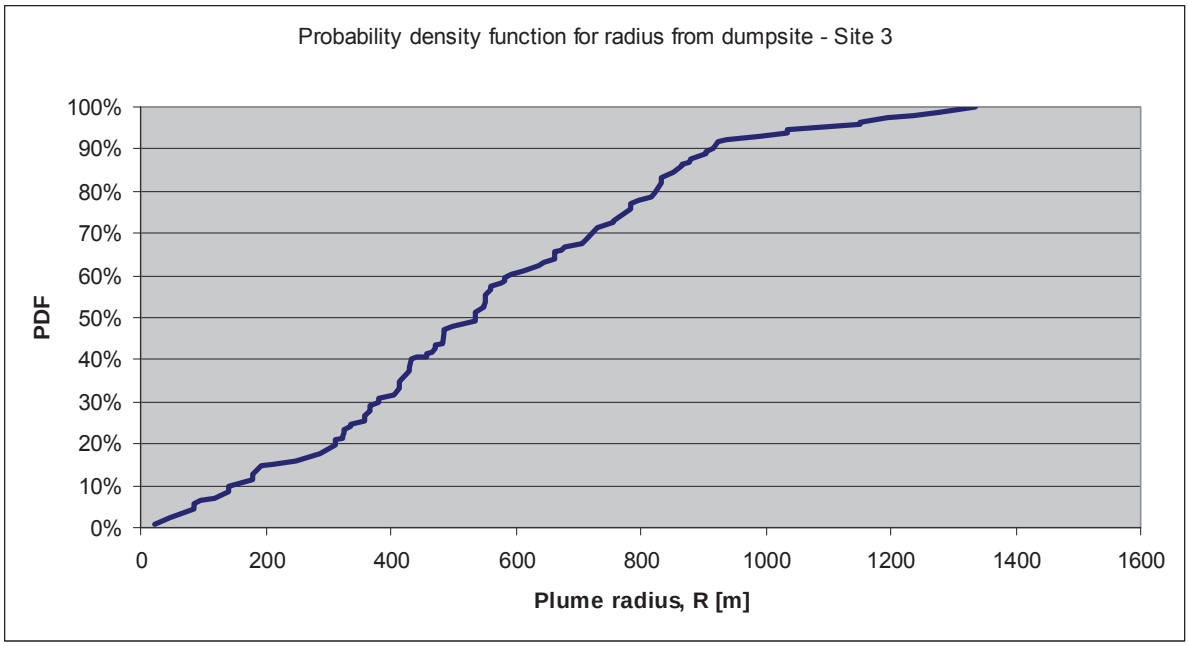


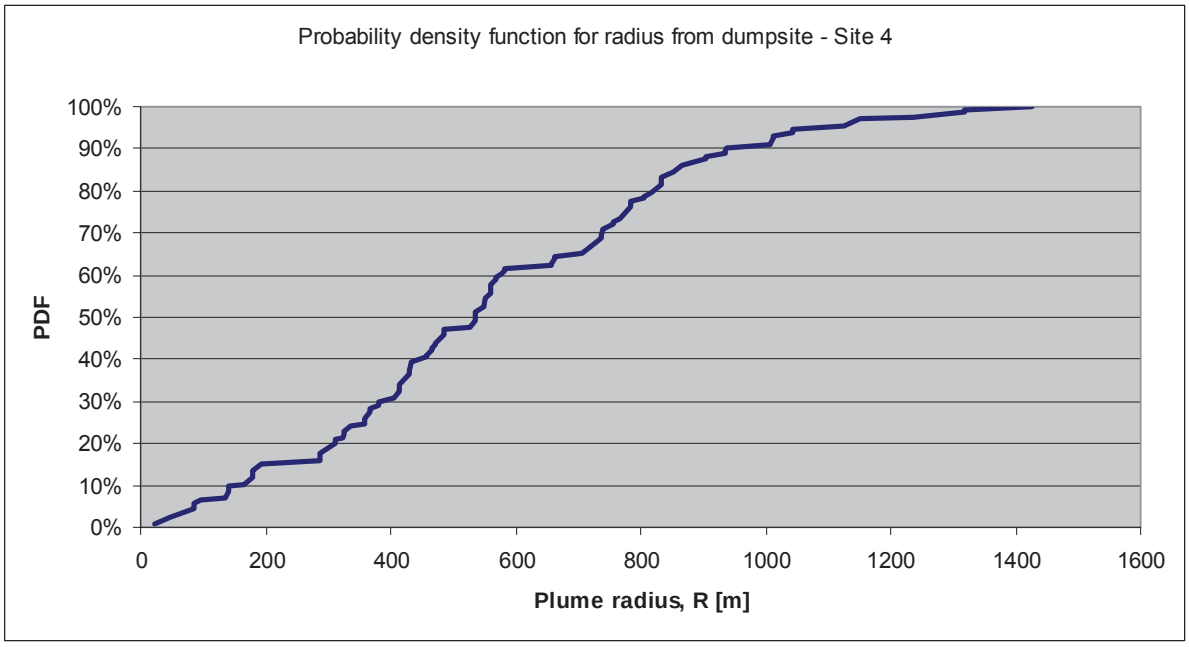
Figure 24 Plume extents predicted by trajectory analysis at Site 5

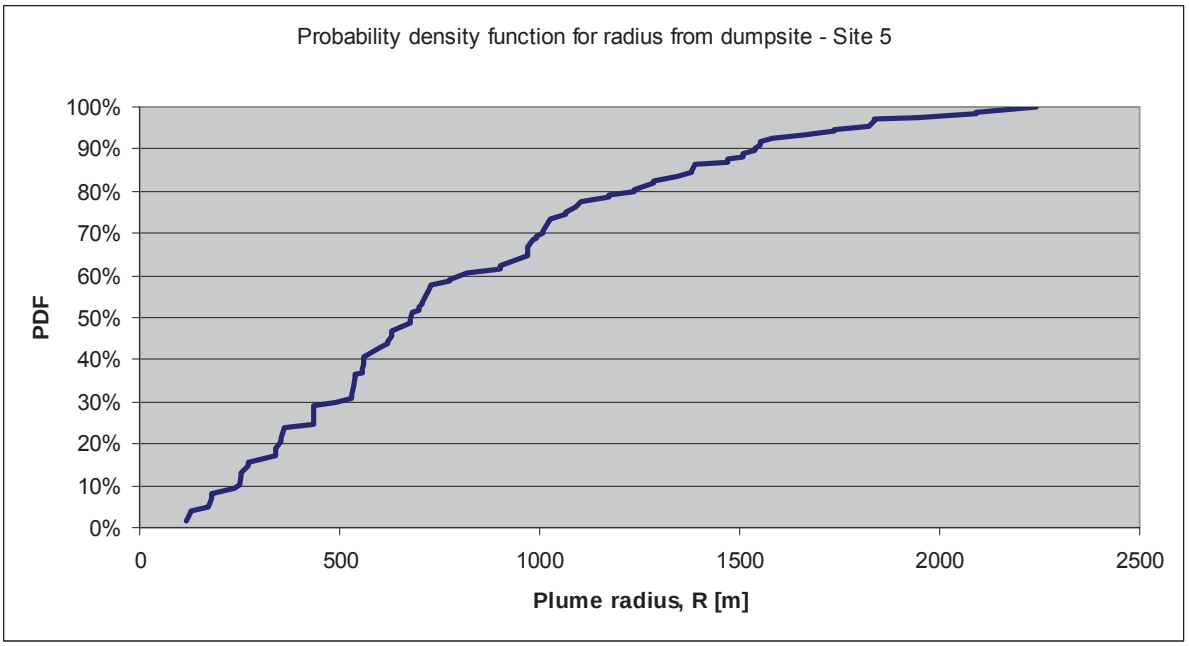
The overall frequency of occurrence for a given plume radius for each of the 5 study sites is presented in the following figures:


Probability density function for radius from dumpsite - Site 1
PDF
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
500
1000
1500
2000
2500
3000
3500
Plume radius, R [m]


Probability density function for radius from dumpsite - Site 2
PDF
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
200
400
600
800
1000
1200
1400
1600
Plume radius, R [m]


Probability density function for radius from dumpsite - Site 3
PDF
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
200
400
600
800
1000
1200
1400
1600
Plume radius, R [m]


Probability density function for radius from dumpsite - Site 4
PDF
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
200
400
600
800
1000
1200
1400
1600
Plume radius, R [m]



This trajectory-plume radius analysis indicates that turbidity plumes at the inlet and oulet of Sabine Lake could effect areas as large as 2-3km while in the center of the lake the plume-affected areas would be more typically about 1km wide.

Background Erosion Rates

Using these 5 study sites and the statistical summaries of winds and currents, it is possible to make some preliminary estimates of the natural sediment entrainment rates in the region that would provide the background turbidity against which dredging activities should be evaluated. Using typical values for the erosion rates of estuarine muds as presented in Whitehouse et al (2000), an order-of-magnitude estimate of average entrainment rates is as follows (expressed in kg of sediment removed per square meter of lakebed per day) in Table 7.

Table 7 Background entrainment rates at Sabine Lake (due to natural processes)

Site	Entrainment rate [kg/m^2/day]
1	132
2	5
3	5
4	5
5	28

These numbers indicate that the effects of tidal currents create a much larger sediment entrainment rate at site 1 (near the outlet of Sabine

Lake) than elsewhere in the lake. Entainment rates in the central portion of the lake are fairly consistent and relatively much lower, and rates increase again near the inlet at site 5. By comparison, the backhoe dredging operations are expected to entrain suspended sediment at a rate of 140 kg/m^2/day based on TGU of 54 kg/m^3. This suggests that turbidity levels due to dredging in the middle of the lake will be comparable to the background levels presently observed at the lake outlet (site 1).

Terminal Site:

The quantity of material to be excavated at the LNG Terminal site far exceeds any excavation quantities for any of the pipelines. The use of a cutterhead suction dredge at this location along with properly designed and maintained dredged material dewatering operations should significantly reduce the rate of suspended sediment generation at this site. As mentioned in the foregoing, the loss rates for a large cutterhead suction dredge are expected to be of the order of 0.1% and a typical TGU of 5-10 kg/m^3. At an average production rate of 16,000 yd^3/day, it is estimated that about 3 kg/sec of sediment losses would occur. Using the DREDGE model, this would result in the following plume patterns for a 0.5mm/sec fall velocity in the Port Arthur Canal with an average flow velocity of 0.3m/sec and an average depth of 12m. Given that the average background TSS in the canal is of the order of 40 mg/L it is unlikely that dredging-related turbidity is likely to be a severe problem here. However, best dredging practices and close monitoring would still be advised.

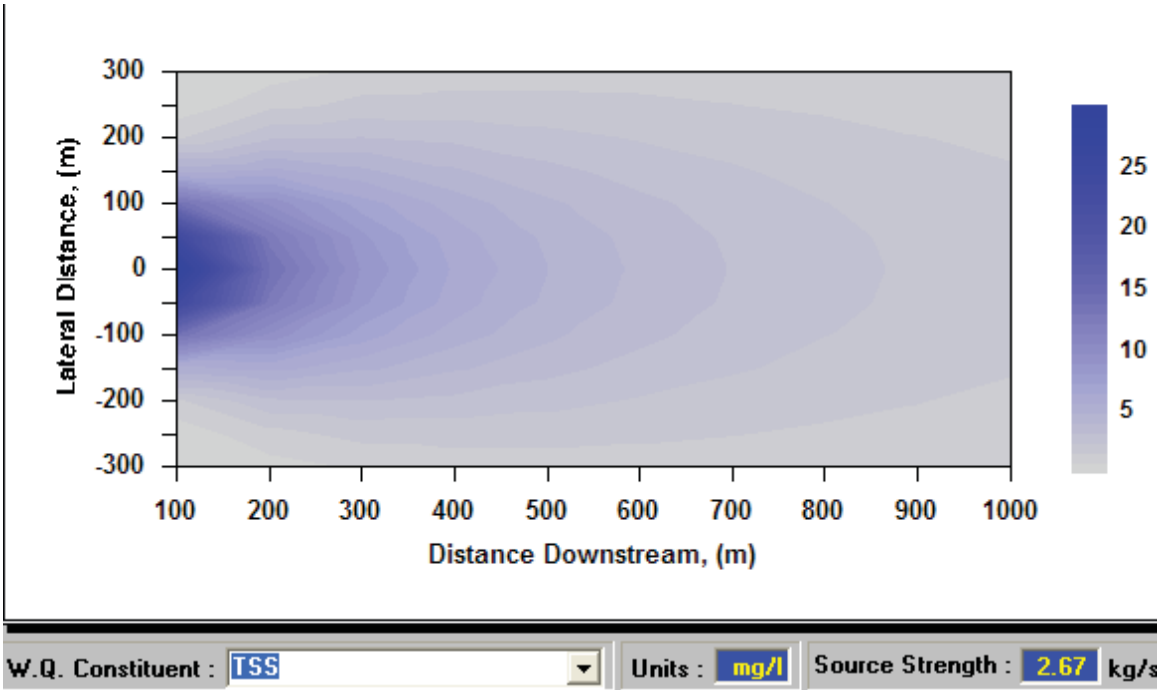


Figure 25 Predicted plume characteristics in Port Arthur Canal from LNG Terminal dredging

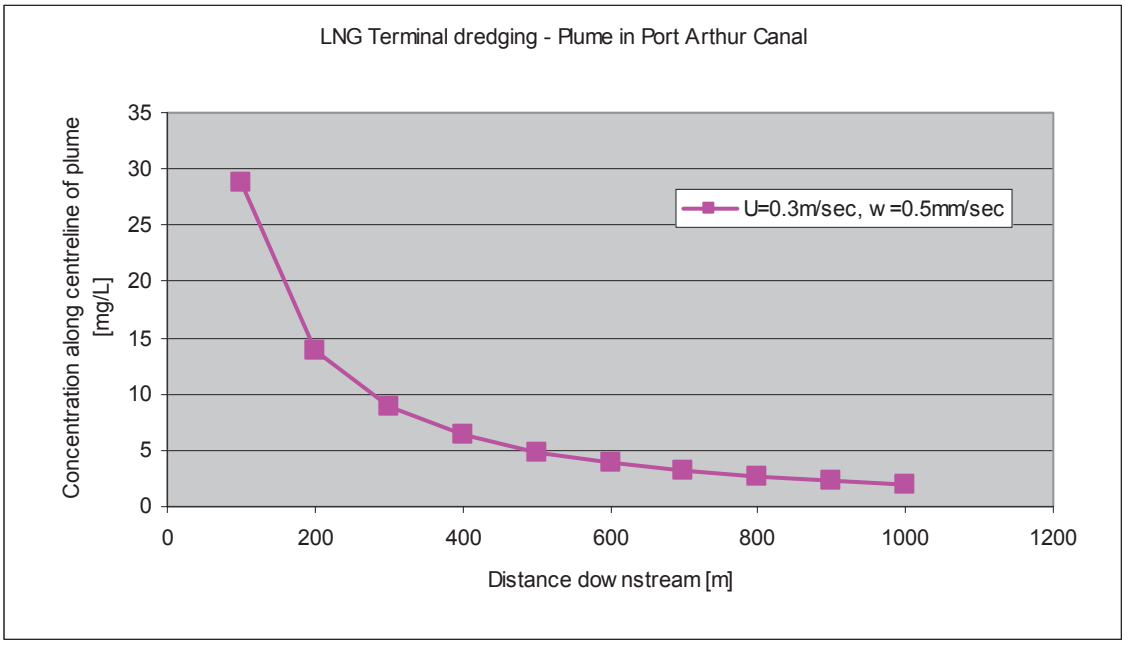


Figure 26 Concentration down centreline of plume - Port Arthur Canal

Summary and Recommendations

The brief analysis undertaken herein indicates that the proposed dredging activities for the Port Arthur LNG terminal are unlikely to have extensive adverse effects in the Port Arthur Canal or in Keith Lake. Proposed dredging activities at Keith Lake Cut and in all but the lowest reaches of Sabine Lake do have the potential to generate turbidity levels above background concentrations. However the ambient turbidity levels in the water (generated by flows, waves and ship traffic) create a high background level of turbidity thereby reducing the relative impact of dredging-related turbidity. The work in Keith Lake Cut is also part of restoration work planned for Keith Lake Cut, which will be designed to benefit Keith Lake Cut and Keith Lake, as well as the surrounding marsh..

If more detailed analysis were required to more accurately assess the extent of turbidity and sedimentation problems in these areas, field measurements of background turbidity levels and more detailed analysis of in-situ soils would be needed. With this more detailed data it would be possible to develop a calibrated and robust computational model for analyzing circulation patterns and sediment behavior in these areas.

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APPENDIX 2.D

Wetland Delineation Report for Sempra LNG Property

WETLAND DELINEATION REPORT

For

Port Arthur LNG Property

Located In

JEFFERSON COUNTY, TEXAS
Abstract Numbers 12, 71, 123, 185, 251, 331, 438, 488, 770, 780, & 927

Prepared for:

Port Arthur LNG, LLC
2925 Briar Park Drive, Suite 900
Houston, TX 77042

February 2015

TBS Project Number 2015.0077

Prepared by:

T. BAKER SMITH, LLC
SOLUTIONS START HERE

Urban Planning | Environmental Science & Regulatory Compliance | Land, Hydrographic, & Offshore Surveying | Civil & Coastal Engineering | GIS & Mapping

1.866.357.1050 www.tbsmith.com

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INTRODUCTION

Port Arthur LNG, LLC retained T. Baker Smith, LLC (TBS) to provide the following wetland delineation in Jefferson County within the State of Texas (**Appendix A**). The Port Arthur LNG property can be accessed from state highway 87 in Jefferson County, Texas. The areas delineated consisted of non-wetland, palustrine emergent wetland, estuarine emergent wetland and palustrine scrub/shrub wetland habitats. The total area delineated was approximately 1,990 acres. Refer to the delineation map in **Appendix C** for details.

METHODS

On August 11 - 15 and 18-22, 2014, TBS biologists conducted a wetland delineation of the proposed project area. The delineation method described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* was used in determining and delineating wetlands within the proposed project site. Preliminary data on soils was taken from the *Soil Survey of Jefferson County, Texas* (Web Soil Survey Data), and from the list of hydric soils for Texas. The vegetative indicator status was determined using the *National Wetland Plant List* (Lichvar, Butterwick, Melvin, Kirchner, 2014).

Forty-one sampling points were collected within the proposed project area. At these sampling points, soil pits were dug to at least 16 inches and soil profile samples were examined and photographed. Data collected on the soil, hydrology, and vegetation were recorded on *U.S. Army Corps of Engineers Wetland Determination Data Forms for the Atlantic and Gulf Coastal Plain Region*. Positioning in the field was attained through the use of a Trimble™ Differential Global Positioning System (DGPS) and Terrasync™ software to collect data observations. All collected positions from sampling points and wetland boundaries were input into AutoCAD™ 2013, where the attached maps were created.

RESULTS AND DISCUSSION

The delineated area is described below by sampling points. Plant communities, hydrology, and soils for the sampling points are discussed in detail. The wetlands are classified according to the comprehensive classification system described in the *Classification of Wetland and Deepwater Habitats of the U.S.* (Cowardin, Carter, Golet, & LaRoe, 1979). The classifications of wetlands under the Cowardin system relevant to this project are listed in **Table 1**.

Table 1. Cowardin System Classification

SYSTEM	Subsystem	CLASS
P = Palustrine	NA	EM = Emergent
	NA	SS = Scrub Shrub
E = Estuarine	2	EM = Emergent

The indicator status for the dominant plants observed during the wetland delineation was recorded from the National Wetland Plant List (Lichvar et al., 2014). The List describes the indicator status as follows:

OBL Obligate Wetland (greater than 99 percent occurrence in wetlands)
FACW Facultative Wetland (67-99 percent occurrence in wetlands)
FAC Facultative (34-66 percent occurrence in wetlands)
FACU Facultative Upland (1-33 percent occurrence in wetlands).
NI Non Indicator

Four plant community types were observed within the project area. The existing communities were non-wetland, palustrine emergent, estuarine emergent and palustrine scrub/shrub wetlands. The wetland communities are classified in **Table 2** and are delineated in **Appendix C**.

Table 2. Wetlands Located within the Project Area.

Wetland Acreage	Wetland Type	Cowardin System
1,146 acres	Palustrine Emergent Wetland	PEM
493 acres	Scrub/Shrub Wetland	PSS
146 acres	Estuarine Emergent Wetland	E2EM

Plant Communities

Non-Wetland. Sampling Points 105, 110, 112, 115, 116, 118, 123, 202, 203, 209, 212, 213, 215, 216, and 217 are associated with non-wetlands within the project area. The dominant plants observed at these sampling points are listed in **Table 3.**

Table 3. Dominant Species found in Non-Wetlands within the Project Area.

Stratum	Common Name	Scientific Name	Indicator
Tree	Sugar-Berry	*Celtis laevigata*	FACW
	Chinese Tallow	*Triadica sebifera*	FAC
	Loblolly Pine	*Pinus taeda*	FAC
	Live Oak	*Quercus virginiana*	FACU
Sapling/Shrub	Chinese Tallow	*Triadica sebifera*	FAC
	Jesuit's-Bark	*Iva frutescens*	FACW
	China-Berry	*Melia azedarach*	UPL
	Southern Bay berry	*Morella cerifera*	FAC
	Groundseltree	*Baccharis halimifolia*	FAC
	Sugar-Berry	*Celtis laevigata*	FACW
	Yaupon	*Ilex vomitoria*	FAC
Herbaceous	Southern Dewberry	*Rubus trivialis*	FACU
	Japanese Honey suckle	*Lonicera japonica*	FACU
	Great Ragweed	*Ambrosia trifida*	FAC
	Annual Marsh-Elder	*Iva annua*	FAC
	Seaside Goldenrod	*Solidago sempervirens*	FACW
	Common Reed	*Phragmites australis*	FACW
	Canada Goldenrod	*Solidago canadensis*	FACU
	West Indian Shrub-Verbena	*Lantana urticoides*	FACU
	Eastern Poison Ivy	*Toxicodendron radicans*	FACU
	Virginia Wild Rye	*Elymus virginicus*	FAC

Palustrine Emergent Wetland. Sampling Points 101, 102, 104, 109, 114, 117, 121, 205, 206, 208, 210, 211, and 218 are associated with this community. Wetlands W1, W5, W8, W9, W11, W13, W15, W16, W17, W18, W19, W20, and W25 have been identified as the Palustrine Emergent type of community. The dominant plants observed are listed in **Table 4**.

Table 4. Dominant Species found in Palustrine Emergent Wetlands within the Project Area.

Stratum	Common Name	Scientific Name	Indicator
Sapling/Shrub	Chinese Tallow	*Triadica sebiferum*	FAC
	Sugar-Berry	*Celtis leavigata*	FACW
	Groundsel tree	*Baccharis halimifolia*	FAC
Herbaceous	Common Reed	*Phragmites australis*	FACW
	Tievine	*Ipomoea cordatotriloba*	FAC
	Seaside Club-Rush	*Schoenoplectus robustus*	OBL
	California Club Rush	*Schoenoplectus californicus*	OBL
	Bushy Seaside-Tansy	*Borrichia frutescens*	OBL
	Salt-Meadow Cord Grass	*Spartina patens*	FACW
	Broad-Leaf Cat-Tail	*Typha latifolia*	OBL
	Annual Marsh-Elder	*Iva annua*	FAC
	Brown-Seed Crown Grass	*Paspalum plicatulum*	FAC
	Trumpet-Creeper	*Campsis radicans*	FAC
	Mexican Palo-Verde	*Parkinsonia aculeata*	FAC

Palustrine Scrub Shrub Wetland. Sampling Points 103, 106, 107, 108, 111, 113, 122, 201, 204, 210 and 214 are associated with this community. Wetlands W2, W3, W4, W7, W10, W12, W14, W21, and W24 have been identified as the Palustrine Scrub Shrub type of community. The dominant plants observed are listed in **Table 5**.

Table 5. Dominant Species found in Palustrine Scrub Shrub Wetlands within the Project Area.

Stratum	Common Name	Scientific Name	Indicator
Tree	Chinese Tallow	*Triadica sebifera*	FAC
	Sugar-berry	*Celtis laevigata*	FACW
Sapling/Shrub	Groundsel tree	*Baccharis halimifolia*	FAC
	Jesuit's Bark	*Iva frutescens*	FACW
	Sugar-Berry	*Celtis laevigata*	FACW
	Chinese Tallow	*Triadica sebifera*	FAC
	Southern Bay berry	*Morella cerifera*	FAC
	Jesuit's-Bark	*Iva frutescens*	FACW
Herbaceous	Canada Goldenrod	*Solidago canadensis*	FACU
	Gulf Cord Grass	*Spartina spartinae*	OBL
	Jesuit's-Bark	*Iva frutescens*	FACW
	Bushy Seaside-Tansy	*Borrichia frutescens*	OBL
	Annual Marsh-Elder	*Iva annua*	FAC
	Common Reed	*Phragmites australis*	FACW
	Southern Dewberry	*Rubus trivialis*	FACU
	Japanese Honey suckle	*Lonicera japonica*	FACU
	Seaside Goldenrod	*Solidago sempervirens*	FACW
	Salt-Meadow Cord Grass	*Spartina patens*	FACW
Woody Vine	Sorrelvine	*Cissus incisa*	UPL

Estuarine Emergent Wetland. Sampling Points 119 and 120 are associated with this community. Wetlands W6 and W23 have been identified as the Estuarine Emergent type of community. The dominant plants observed are listed in **Table 6**.

Table 6. Dominant Species found in Estuarine Emergent Wetlands within the Project Area.

Stratum	Common Name	Scientific Name	Indicator
Herbaceous	Coastal Salt Grass	*Distichlis spicata*	OBL
	Seaside Club-Rush	*Schoenoplectus robustus*	OBL
	California Club Rush	*Schoenoplectus californicus*	OBL
	Salt-Meadow Cord Grass	*Spartina patens*	FACW
	Broad-Leaf Cat-Tail	*Typha latifolia*	OBL
	Jesuit's Bark	*Iva frutescens*	FACW

Hydrology

Hydrology for the proposed project area is influenced by spoil brought in from dredging the Gulf Intracoastal Waterway and the Sabine-Neches Waterway.

Sampling Points 101, 102, 103, 104, 106, 107, 108, 109, 111, 113, 114, 117, 119, 120, 121, 122, 123, 201, 204, 205, 206, 207, 208, 210, 211, 214, and 218 were collected within a wetland. Methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (USACE, 2010)* were used to determine the presence of wetland hydrology indicators in the field. A wetland must have one primary indicator or two secondary indicators to make the hydrology requirements. The most common primary hydrological indicators for this project were high water table (A2), saturation (A3), and oxidized rhizospheres along living roots (C3).

Mapped Soil Types

The Soil Survey for Jefferson County, Texas describes four soil types within and adjacent to the project area: Bancker mucky peat (0-1 percent slopes, frequently flooded, tidal), Caplen mucky peat (0-1 percent slopes, frequently flooded, tidal), Ijam clay (0-2 percent slopes, frequently flooded, tidal), Neel clay (2-5 percent slopes, occasionally flooded, tidal). These soil types are mapped in **Appendix B**.

The Bancker mucky peat (0-1 percent slopes, frequently flooded, tidal) soil type is a very deep, very poorly drained, very slowly permeable soils. They have been deposited under water and never air-dried and or consolidated. These soils are very fluid clayey in intermediate or brackish marshes. It is common for these soils to be silt clay loam or clay throughout with some being stratified. The water level is usually at depths of one foot above to one half foot below the soil surface. This soil is listed as a hydric soil.

Caplen mucky peat (0-1 percent slopes, frequently flooded, tidal) soils are formed in unconsolidated clayey costal sediments that are permanently saturated with water. They are from backwater marsh areas and are associated with tidal areas. Caplan mucky peat is formed from clayey alluvial sediments near the coast and are covered with two to fourteen inches of water by daily high tides. This soil is very poorly drained and very slowly permeable. This soil is listed as a hydric soil.

Ijam clay (0-2 percent slopes, frequently flooded, tidal). These soils are very poorly drained, very slowly permeable soils that formed from materials dredged from nearby canals. Subsequently they can be found in coastal areas bordering waterways, ditches and canals. The Ijam clays are typically flooded by saline water at high tides. This soil is listed as a hydric soil.

Neel clay (2-8 percent slopes, occasionally flooded, tidal) is a very deep, moderately well drained, very slowly permeable soil. These soils are formed in clayey deposits dredged from bays and marshes. This clay is commonly found on levees and spoil banks. This soil is not listed as a hydric soil.

Observed Soil Types

The soils observed at sampling points located in wetlands met the criteria for hydric soils (USDA, NRCS. 2010). The most common soils found within the project area were a very dark gray with dark yellowish brown redox in the form of oxidized rhizospheres. The soils in the project area do not represent the historical mapped soils. The historical mapped soils are all described as frequently flooded and tidal whereas, the existing project area is mostly made up of silt and clay spoil that has been dredged from the nearby Gulf Intracoastal and Sabine Neches Waterways. These soils all met the F3 Depleted matrix, or F6 Redox Dark Surface, hydric soil indicator.

WETLAND DETERMINATION

Data was collected at forty-one sampling points to evaluate the presence or absence of hydrophytic vegetation, hydric soils, and wetland hydrology. Three wetland types were determined and delineated within the project area. Wetland types were palustrine emergent, estuarine emergent and palustrine scrub/shrub. The wetlands contained hydrophytic vegetation, hydric soils, and wetland hydrology. Since all three wetland parameters were met, 1,785 acres were determined to be wetlands as defined by the U.S. Army Corps of Engineers, within the 1,990 acre surveyed area.

CONCLUSION

On behalf of our client, Port Arthur LNG, LLC, TBS Environmental Professionals delineated approximately 1,990 acres in Jefferson County, Texas. Three wetland types were found including 1,146 acres of palustrine emergent wetlands, 146 acres of estuarine emergent wetlands and 493 acres of palustrine scrub/shrub wetlands. It should be noted that this report is the professional opinion of TBS biologists, and the U. S. Army Corps of Engineers has final authority over jurisdictional wetland determinations.

REFERENCES

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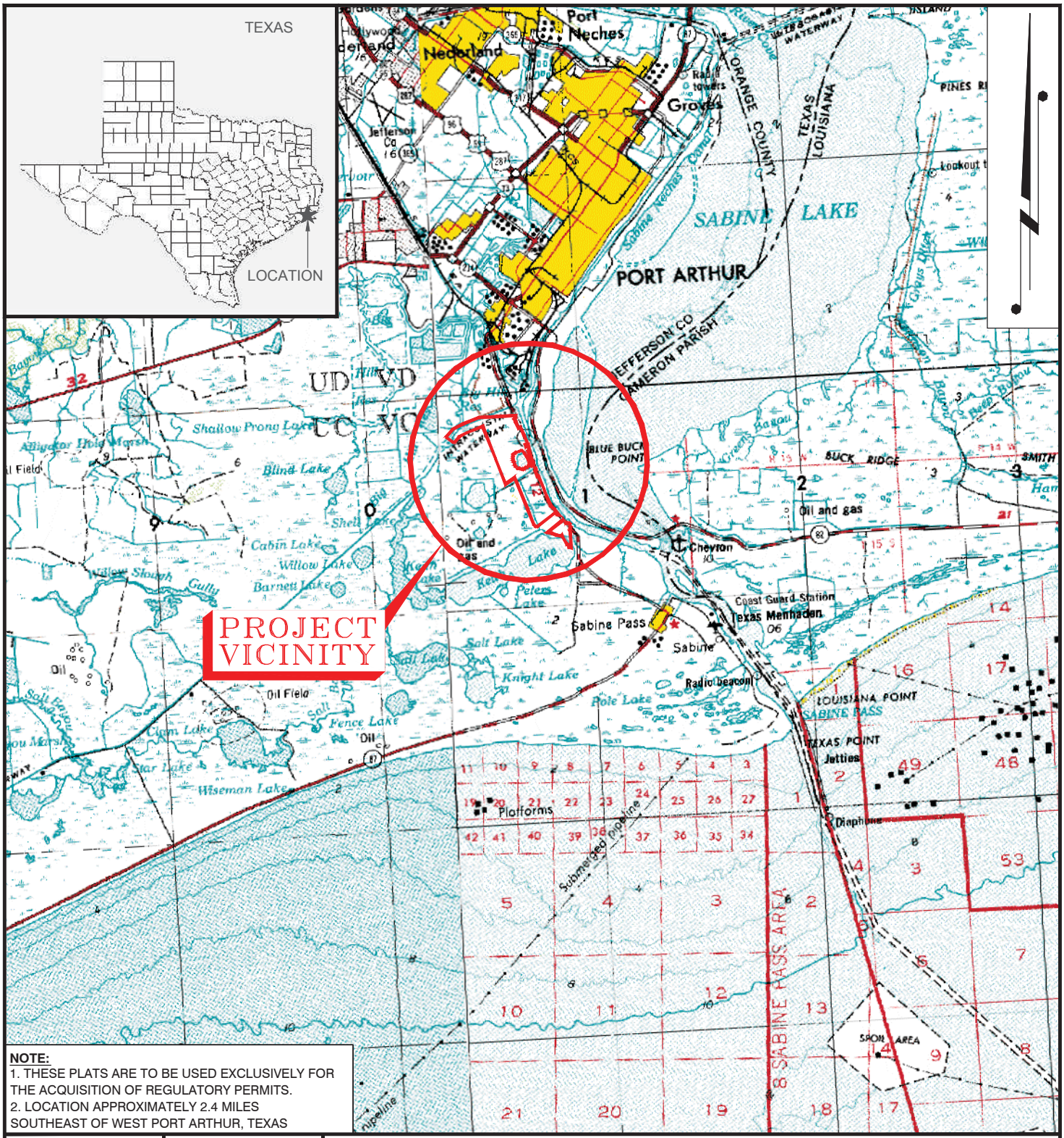
APPENDIX A

VICINITY MAP
Wetland Delineation
Port Arthur LNG, LLC
Jefferson County, Texas



NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.
2. LOCATION APPROXIMATELY 2.4 MILES SOUTHEAST OF WEST PORT ARTHUR, TEXAS

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/26/14	JOB NO:	2015.0077
DRAWING NAME:	150077_VIC_WD_REV2.DWG		
SHEET NO:	1	OF	11

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 4 MILES

4 MI 2 MI 0' 4 MI

VICINITY MAP

PORT ARTHUR LNG, LLC

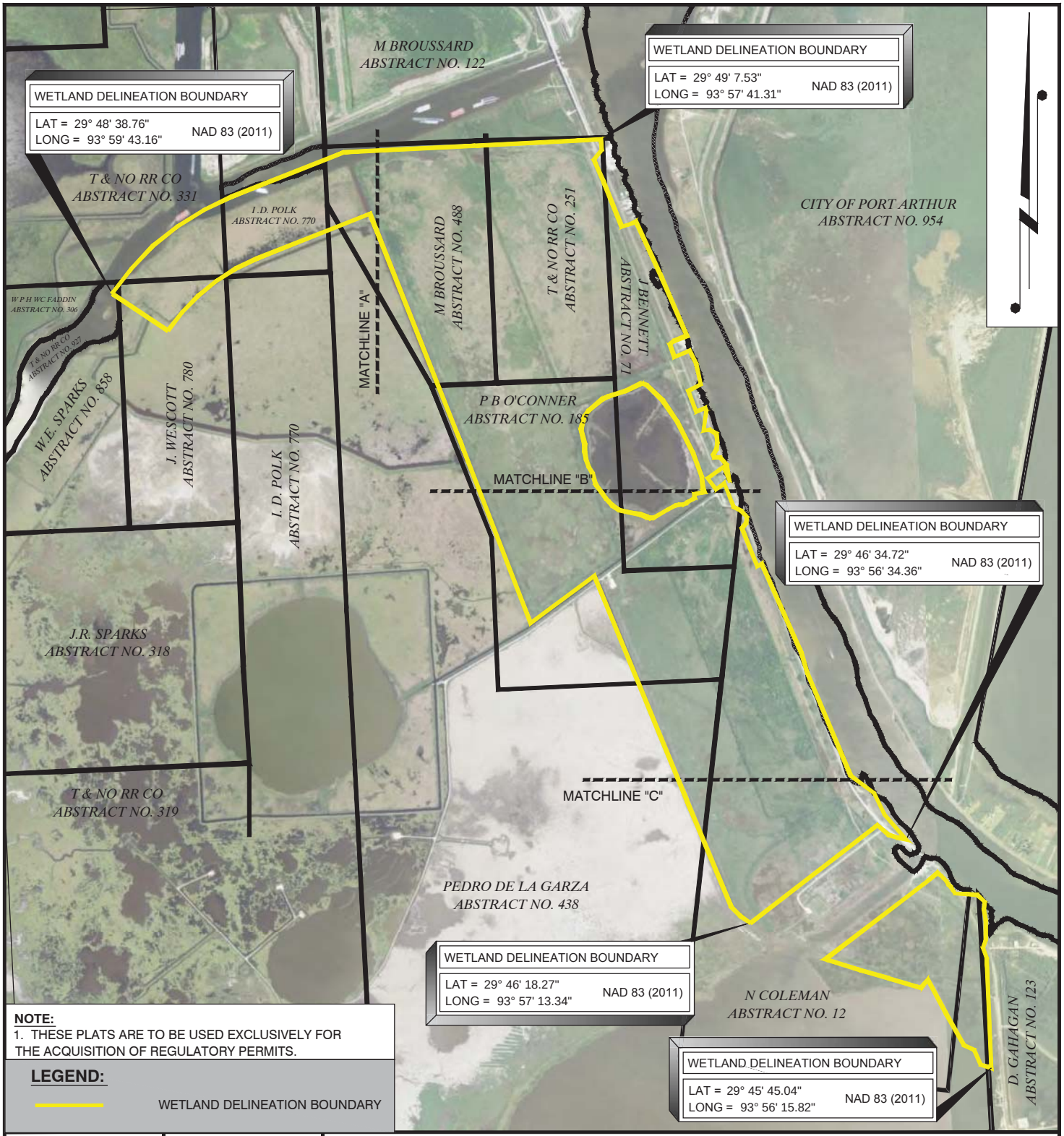
WETLAND DELINEATION
FOR THE
PORT ARTHUR LNG PROPERTY
LOCATED IN ABSTRACT NOS. 12,71,123,185,251,331,438,488,770,780, & 927
JEFFERSON COUNTY, TEXAS

T. BAKER SMITH
SOLUTIONS START HERE
107 Global Circle, Lafayette, LA 70503
(337)735-2800 - tbsmith.com

REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/11/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_VIC_WD_REV2.DWG



NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

LEGEND:

WETLAND DELINEATION BOUNDARY

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_AREA_WD_REV2.DWG		
SHEET NO:	2 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 3000'

3000' 1500' 0' 3000'

AREA MAP

PORT ARTHUR LNG, LLC

WETLAND DELINEATION
FOR THE
PORT ARTHUR LNG PROPERTY
LOCATED IN ABSTRACT NOS. 12,71,123,185,251,331,438,488,770,780, & 927
JEFFERSON COUNTY, TEXAS

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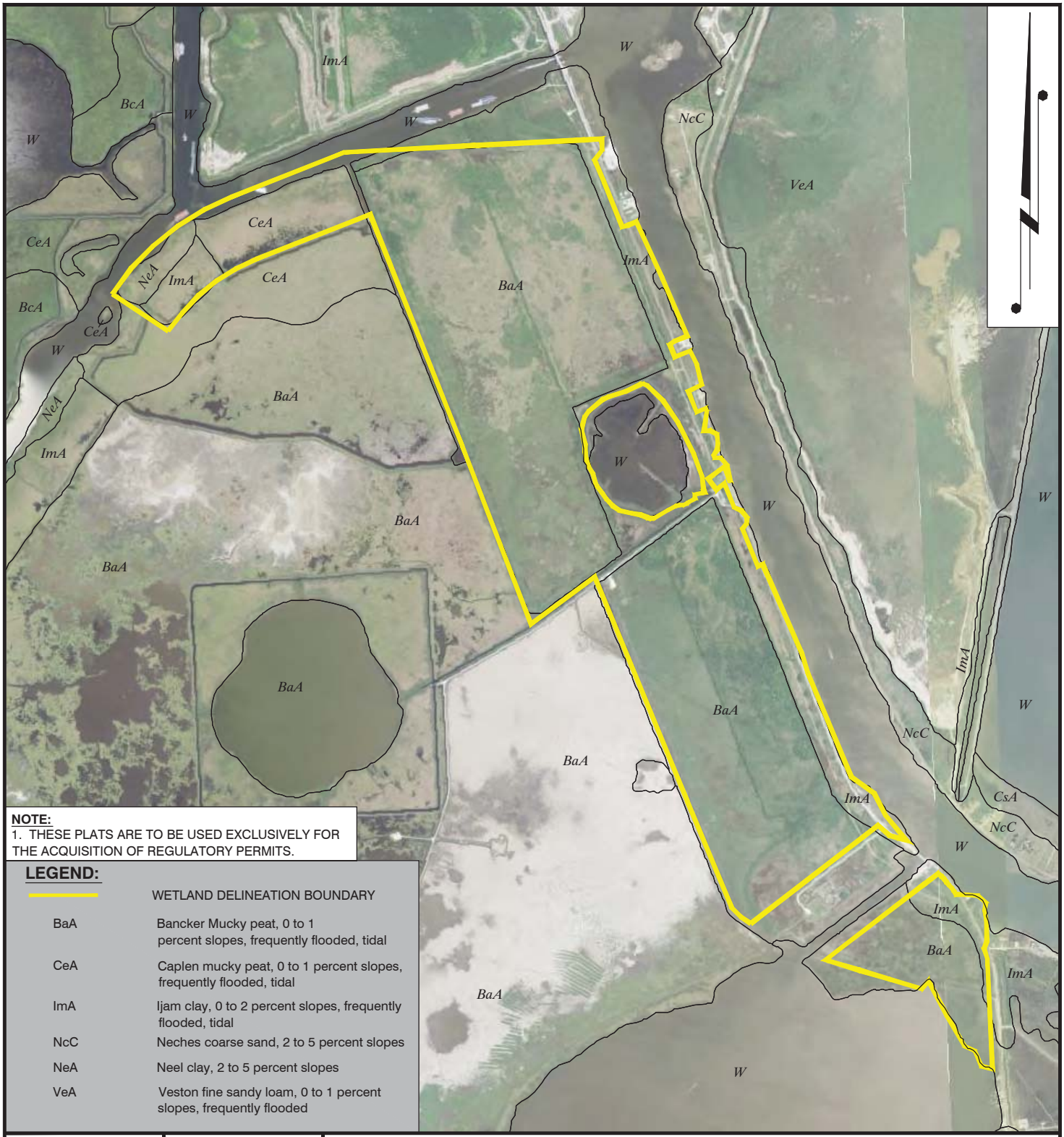
REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/11/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_AREA_WD_REV2.DWG

APPENDIX B

SOILS MAP
Wetland Delineation
Port Arthur LNG, LLC
Jefferson County, Texas



NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

LEGEND:

	WETLAND DELINEATION BOUNDARY
BaA	Bancker Mucky peat, 0 to 1 percent slopes, frequently flooded, tidal
CeA	Caplen mucky peat, 0 to 1 percent slopes, frequently flooded, tidal
ImA	Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal
NcC	Neches coarse sand, 2 to 5 percent slopes
NeA	Neel clay, 2 to 5 percent slopes
VeA	Veston fine sandy loam, 0 to 1 percent slopes, frequently flooded

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_SOIL MAP_REV2.DWG		
SHEET NO:	3 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 3000'

3000' 1500' 0' 3000'

SOIL MAP

PORT ARTHUR LNG, LLC

WETLAND DELINEATION
FOR THE
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JEFFERSON COUNTY, TEXAS

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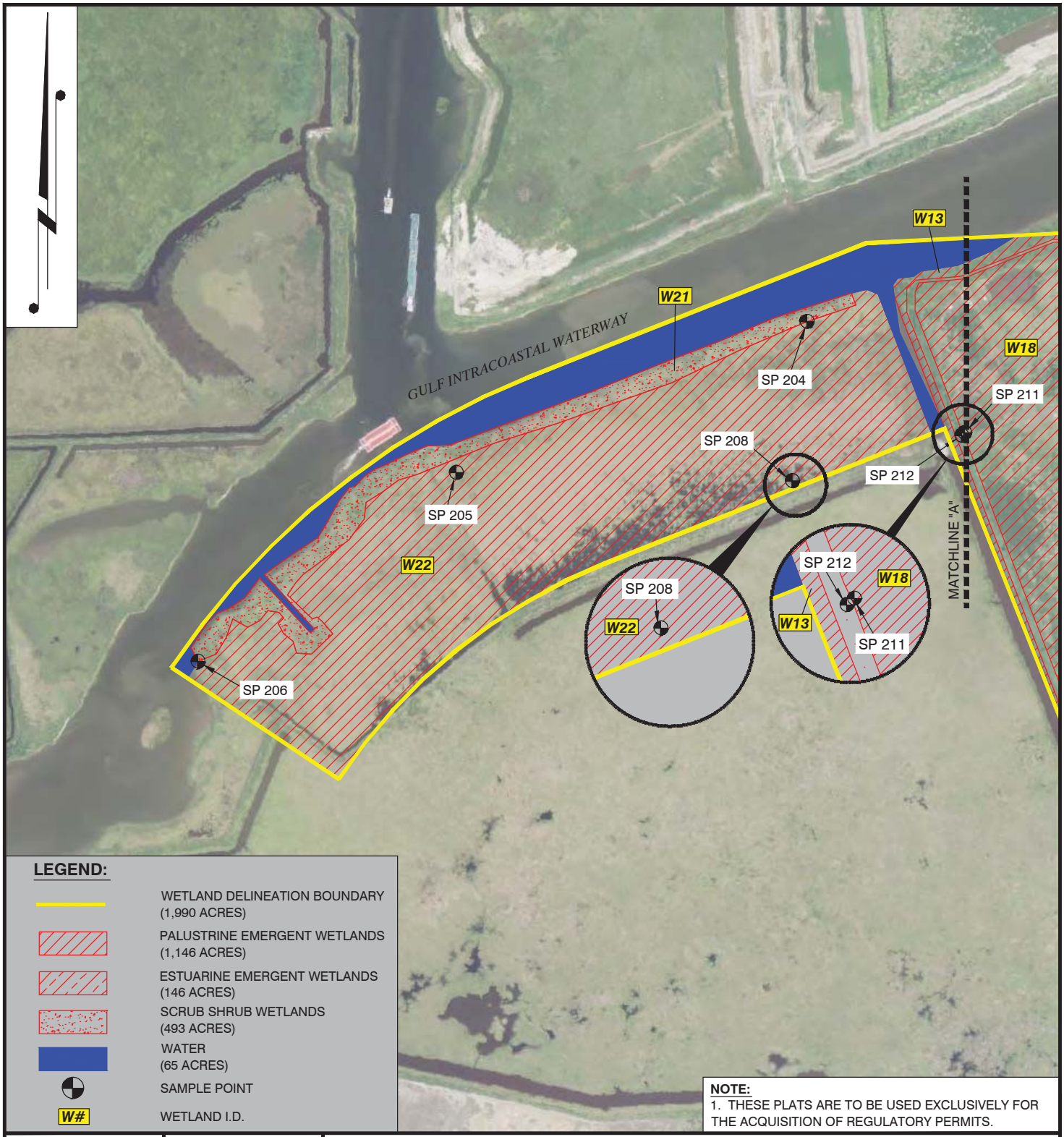
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/11/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_SOIL MAP_REV2.DWG

APPENDIX C

WETLAND DELINEATION MAP
Wetland Delineation
Port Arthur LNG, LLC
Jefferson County, Texas



LEGEND:

- WETLAND DELINEATION BOUNDARY (1,990 ACRES)
- PALUSTRINE EMERGENT WETLANDS (1,146 ACRES)
- ESTUARINE EMERGENT WETLANDS (146 ACRES)
- SCRUB SHRUB WETLANDS (493 ACRES)
- WATER (65 ACRES)
- SAMPLE POINT
- W# WETLAND I.D.

NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_PLAN_WD_REV2.DWG		
SHEET NO:	4 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

WETLAND DELINEATION
FOR THE
PORT ARTHUR LNG PROPERY
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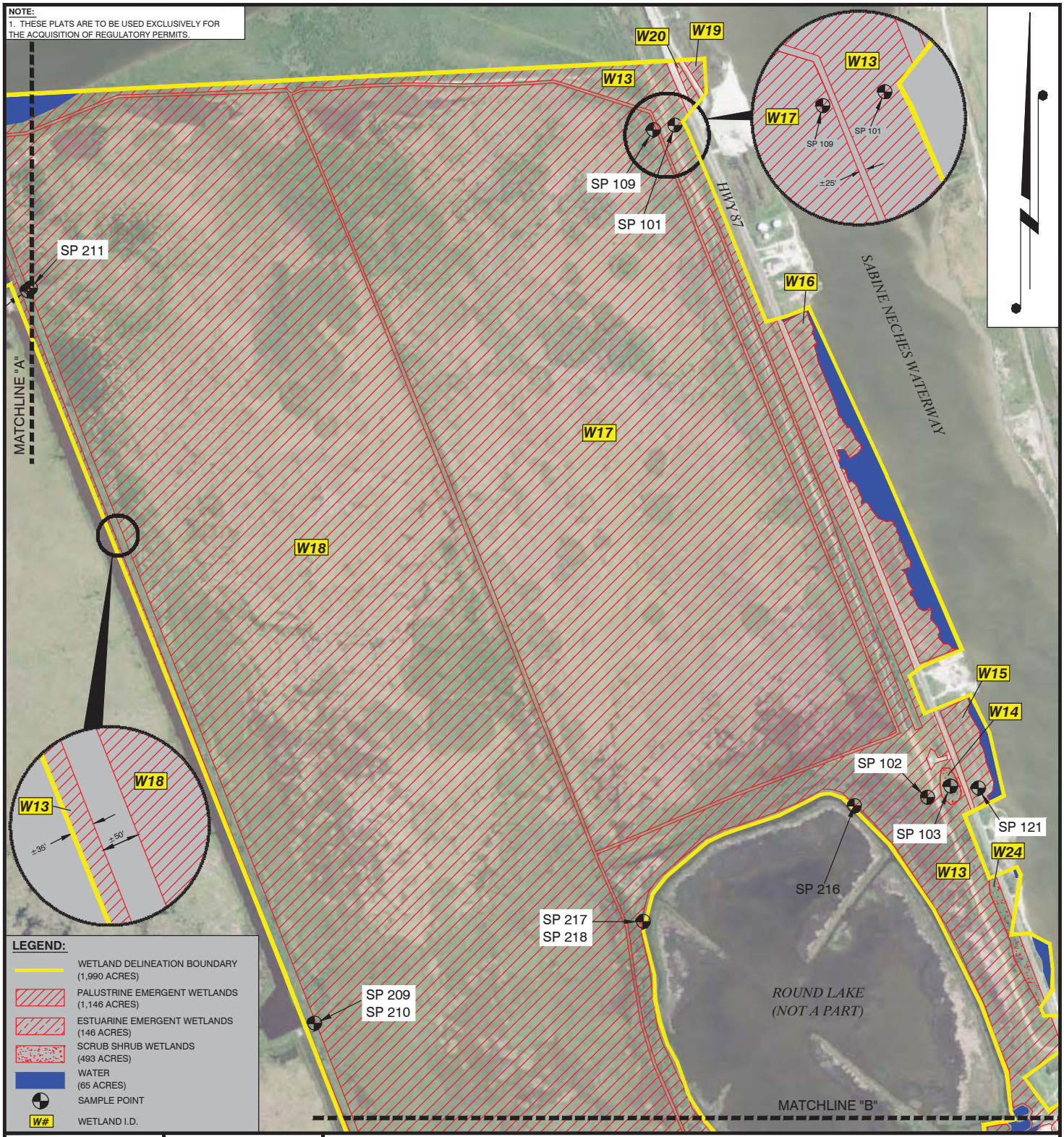
REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.



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DATE:	08/25/14	JOB NO:	2015.0077
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SHEET NO:	5 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

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2	02/03/2015	JJR

REVISION DESCRIPTION:
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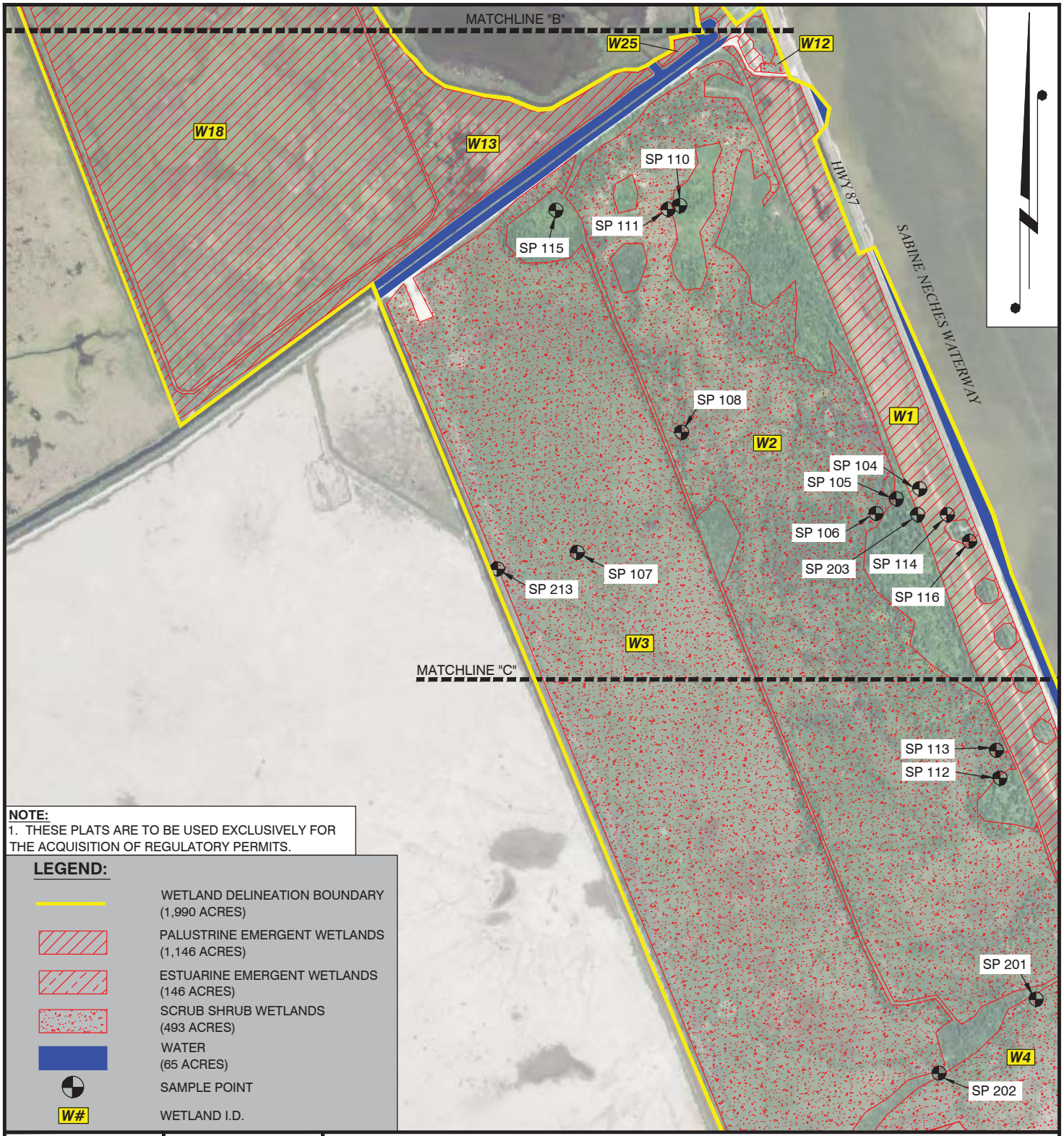
2/13/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_PLAN_WD_REV2.DWG



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- ESTUARINE EMERGENT WETLANDS (146 ACRES)
- SCRUB SHRUB WETLANDS (493 ACRES)
- WATER (65 ACRES)
- SAMPLE POINT
- W# WETLAND I.D.

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_PLAN_WD_REV2.DWG		
SHEET NO:	6 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

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REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

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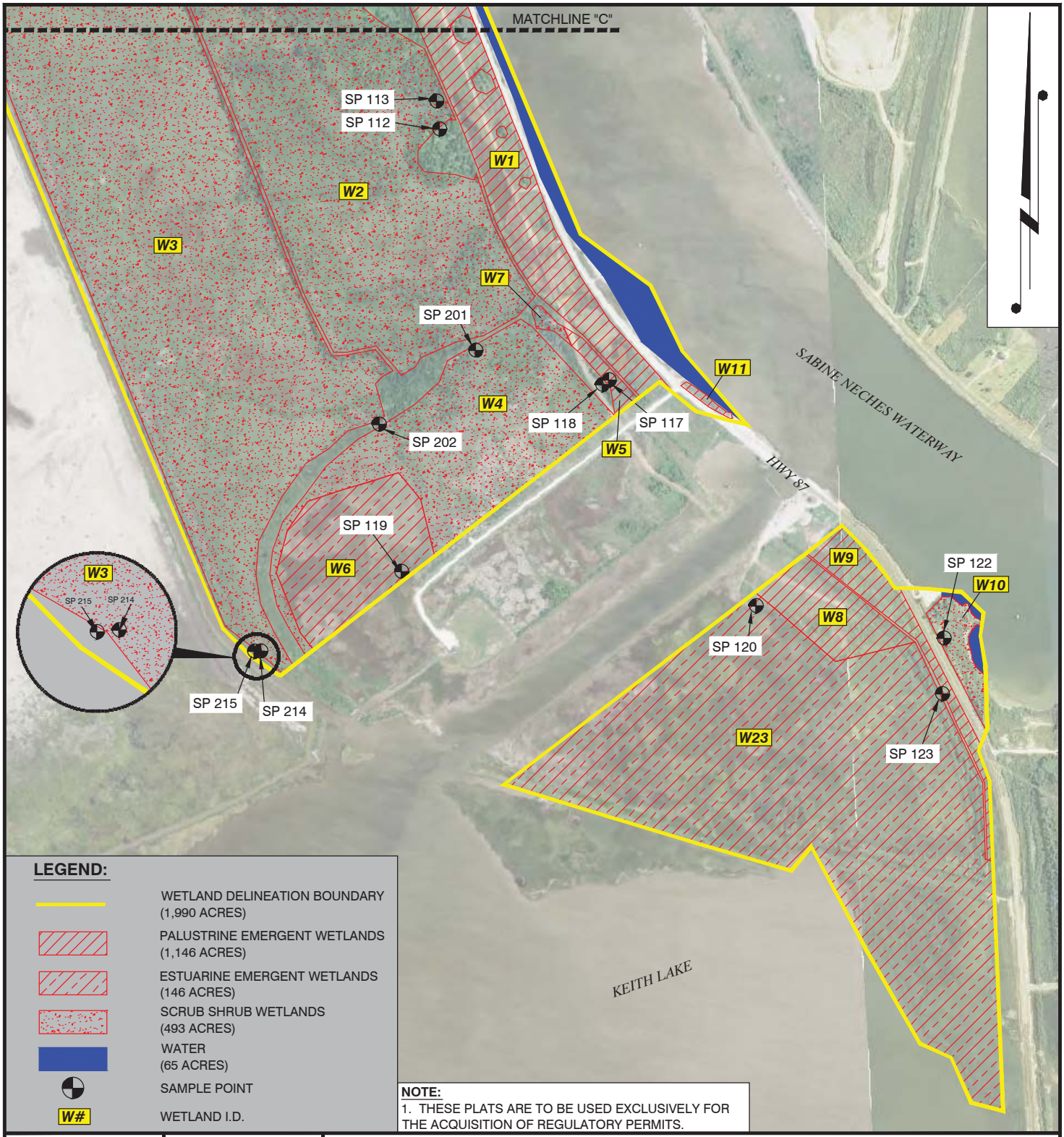

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DATE:	08/25/14	JOB NO:	2015.0077
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SHEET NO:	7	OF	11

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

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REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
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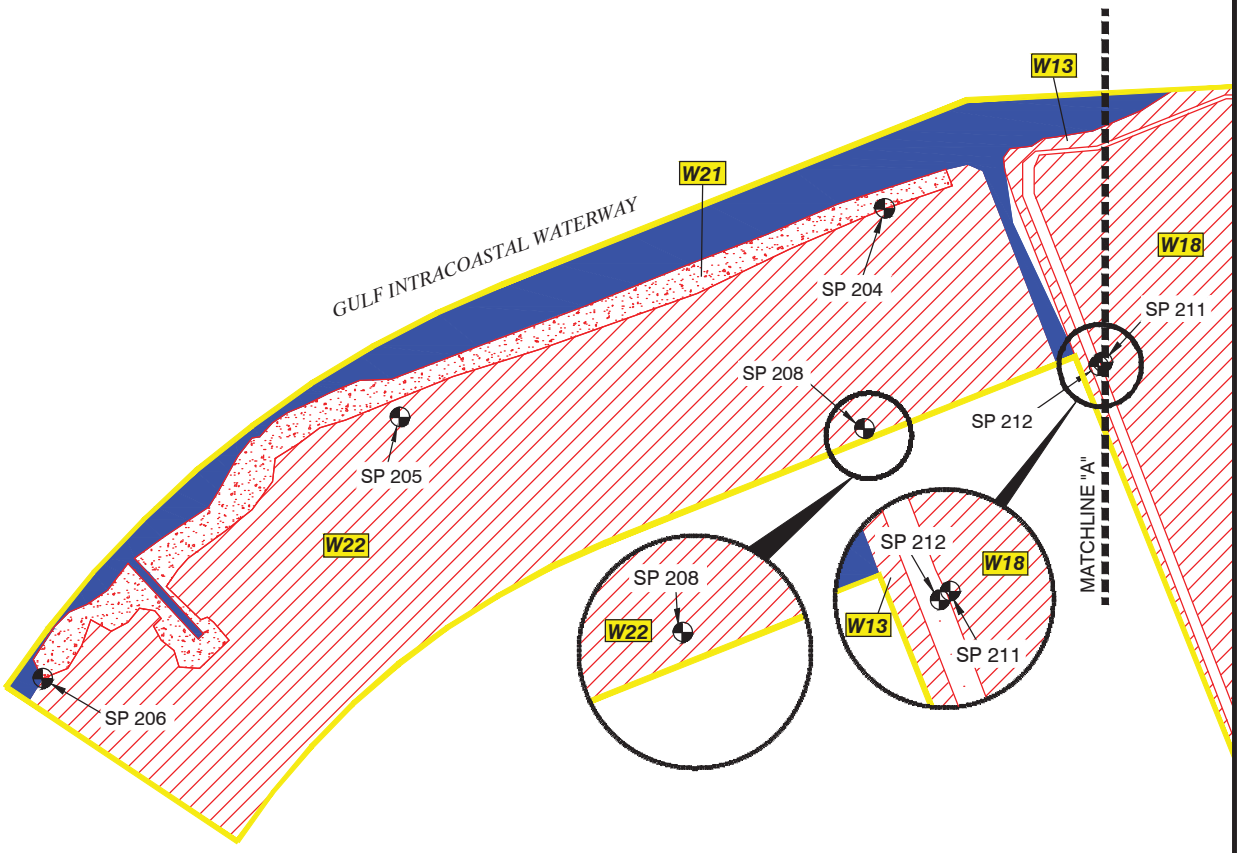

LEGEND:

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- ESTUARINE EMERGENT WETLANDS (146 ACRES)
- SCRUB SHRUB WETLANDS (493 ACRES)
- WATER (65 ACRES)
- SAMPLE POINT
- W# WETLAND I.D.

NOTE:
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DRAWN BY: RRB	APPROVED BY: JJR
DATE: 08/25/14	JOB NO: 2015.0077
DRAWING NAME: 150077_PLAN2_WD_REV2.DWG	
SHEET NO: 8 OF 11	
PROJECTION: TEXAS SOUTH CENTRAL GEO. DATUM: NAD83 | VERT. DATUM: NAVD88 GRID UNITS: US SURVEY FEET	

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

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REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

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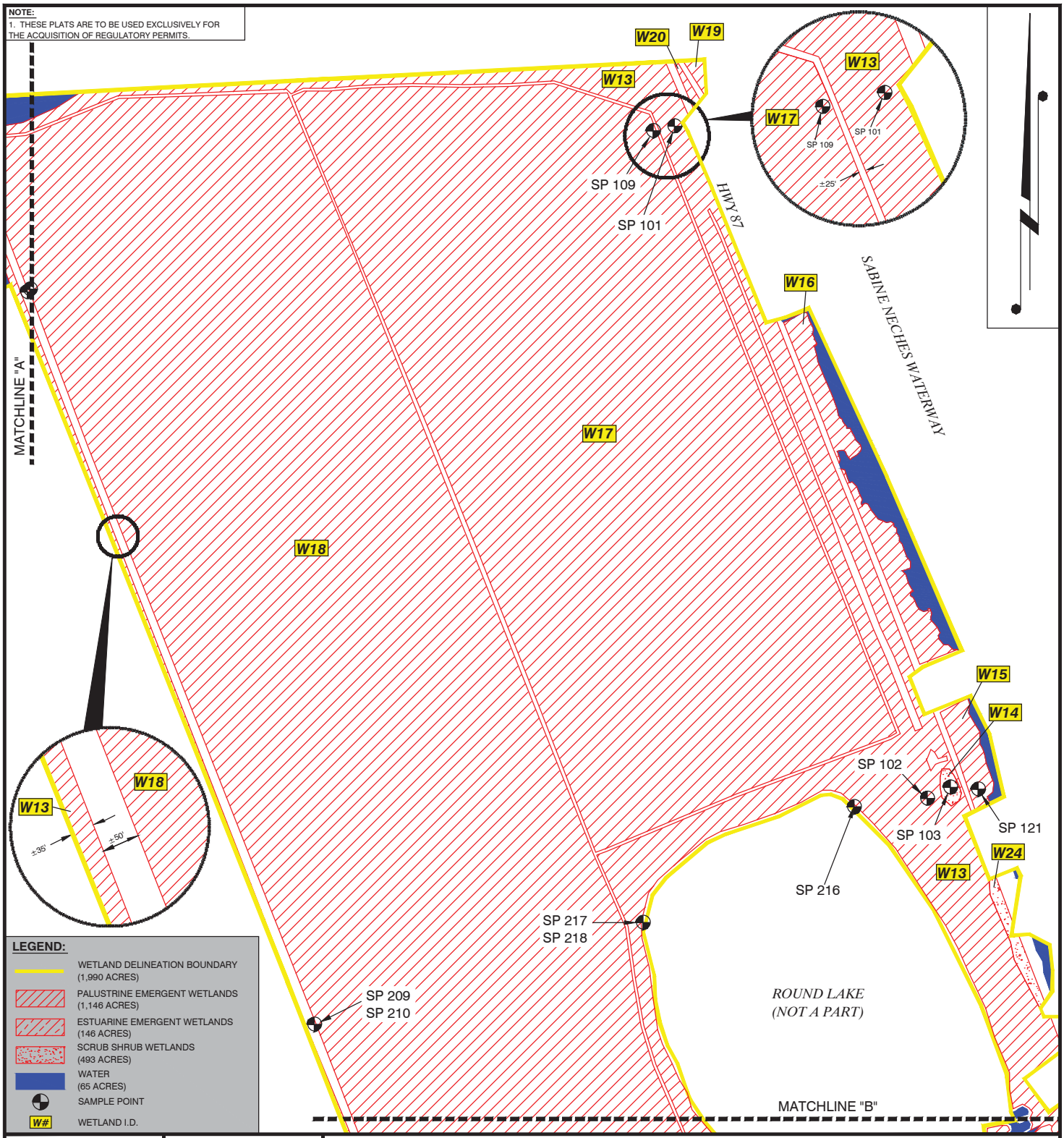

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DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_PLAN2_WD_REV2.DWG		
SHEET NO:	9	OF	11

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'

1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

WETLAND DELINEATION
FOR THE
PORT ARTHUR LNG PROPERTY
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JEFFERSON COUNTY, TEXAS

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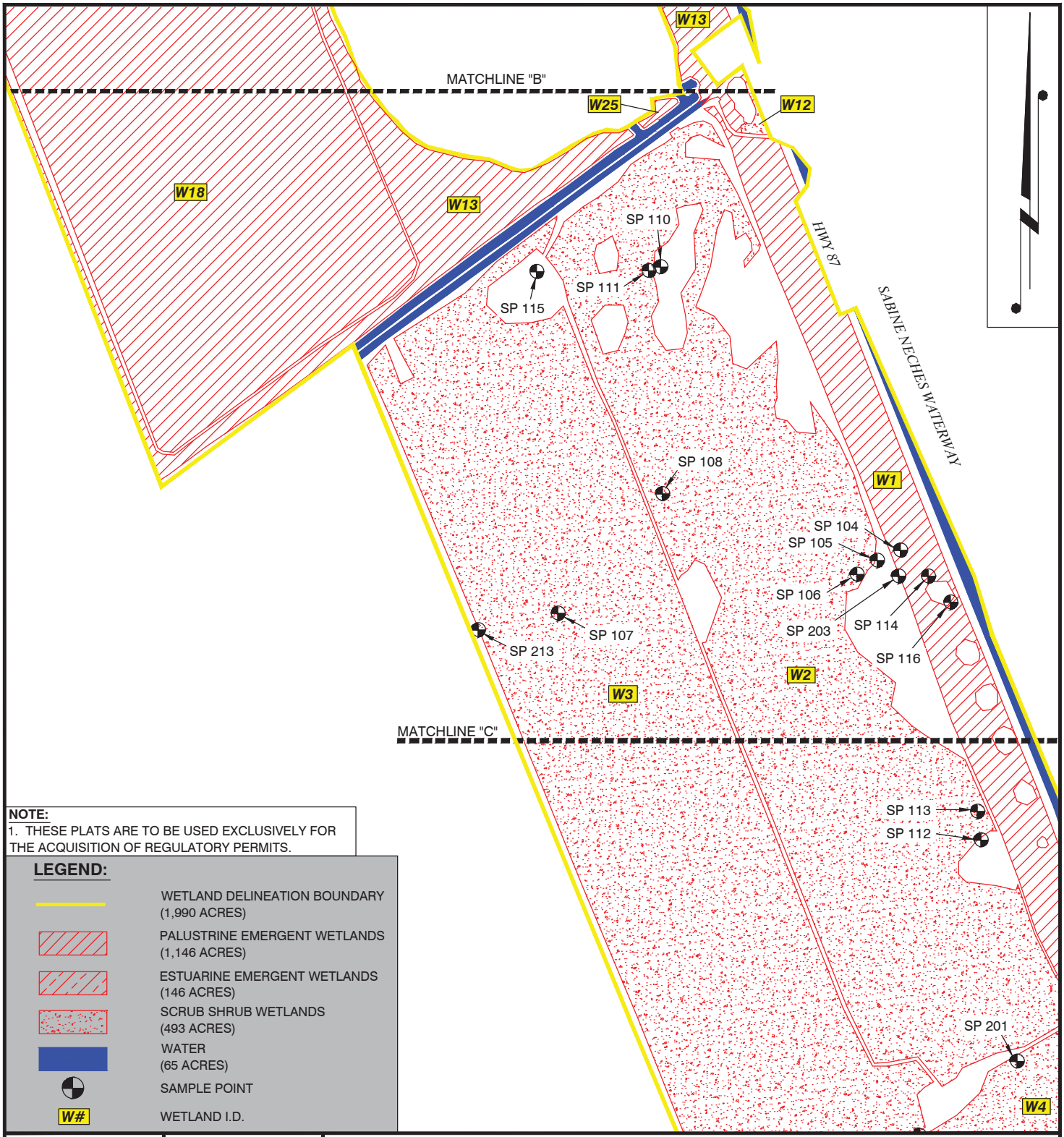
REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/13/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_PLAN2_WD_REV2.DWG



NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

LEGEND:

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- W# WETLAND I.D.

DRAWN BY:	RRB	APPROVED BY:	JJR
DATE:	08/25/14	JOB NO:	2015.0077
DRAWING NAME:	150077_PLAN2_WD_REV2.DWG		
SHEET NO:	10 OF 11		

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'
1000' 500' 0' 1000'

PLAN VIEW

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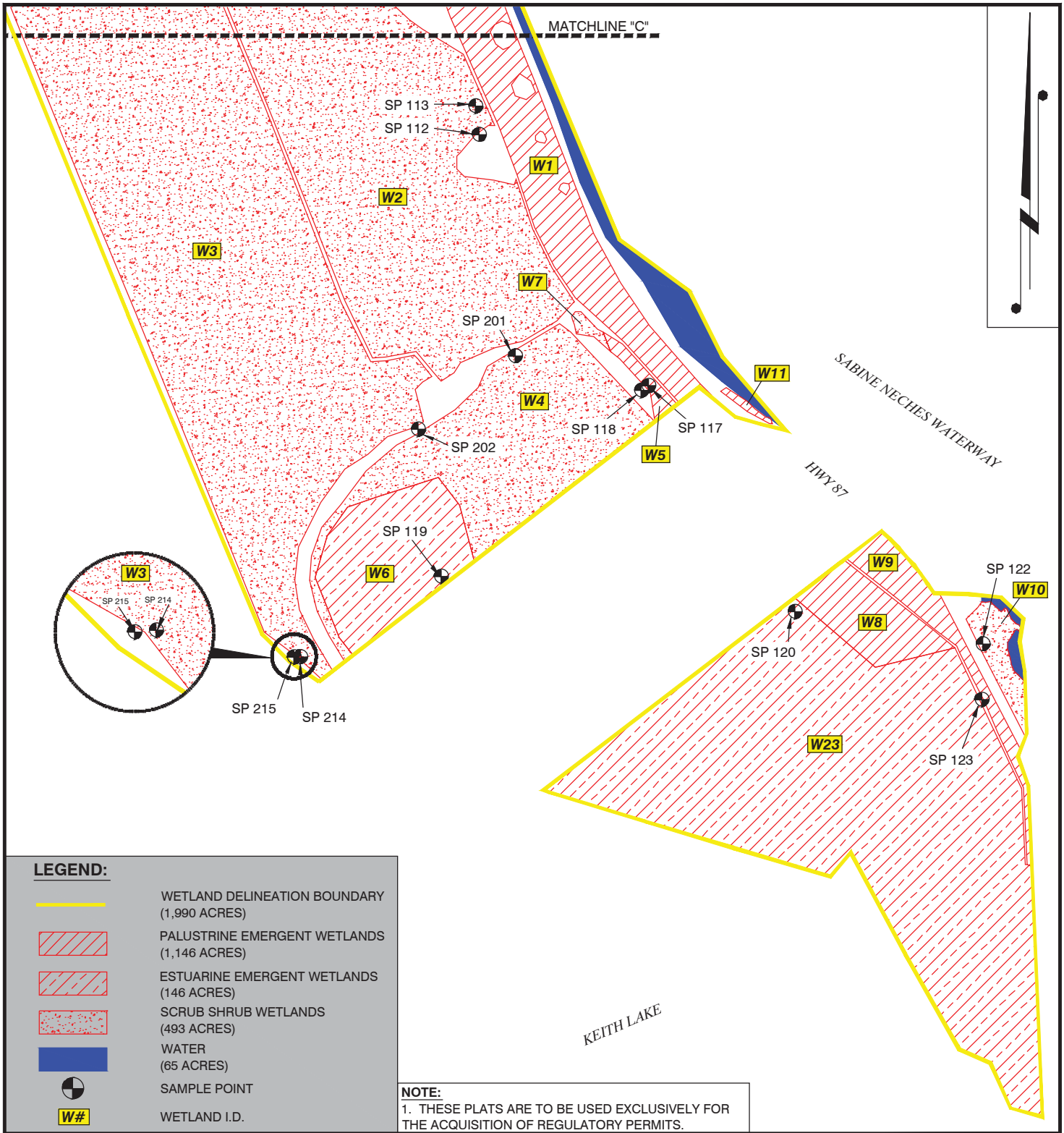
REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/13/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_PLAN2_WD_REV2.DWG



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- SAMPLE POINT
- W# — WETLAND I.D.

NOTE:
1. THESE PLATS ARE TO BE USED EXCLUSIVELY FOR THE ACQUISITION OF REGULATORY PERMITS.

DRAWN BY: RRB	APPROVED BY: JJR
DATE: 08/25/14	JOB NO: 2015.0077
DRAWING NAME: 150077_PLAN2_WD_REV2.DWG	
SHEET NO: 11 OF 11	

PROJECTION: TEXAS SOUTH CENTRAL
GEO. DATUM: NAD83 | VERT. DATUM: NAVD88
GRID UNITS: US SURVEY FEET

SCALE: 1" = 1000'
1000' 500' 0' 1000'

PLAN VIEW

PORT ARTHUR LNG, LLC

WETLAND DELINEATION
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JEFFERSON COUNTY, TEXAS

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REV. NO:	REV. DATE:	REV. BY:
2	02/03/2015	JJR

REVISION DESCRIPTION:
REVISED WETLAND ACREAGE CALCULATIONS.

2/13/2015 - P:\Y-2015\2015.0077\DWG\WETLAND DELINEATION\REV 2\150077_PLAN2_WD_REV2.DWG

APPENDIX D

DATA SHEETS
Wetland Delineation
Port Arthur LNG, LLC
Jefferson County, Texas

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 14.0778 Near highway City/County: Jefferson County Sampling Date: 8/12/2014

Applicant/Owner: Sempra State: TX Sampling Point: SP 101

Investigator(s): JTR, JCH Section, Township, Range: see plats

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): < 2

Subregion (LRR or MLRA): LRR T Lat: 29° 49' 02.78" N Long: 93° 57' 44.30" W Datum: NAD 83

Soil Map Unit Name: Bancker Mucky Peat, 0-1 percent slopes, freq. flooded, tidal NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP 101

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	25	Y	FACW
2. Iva annua	25	Y	FAC
3. Parkinson aculeata	25	Y	FAC
4. Paspalum plicatulum	20	Y	FAC
5. Solidago sempervirens	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: SP 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10 YR 3/1	97	10 YR 4/6	3	C	P/L	clay	
8 - 16	10 YR 4/1	90	10 YR 5/6	10	C	P/L	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

APPENDIX E

PHOTOGRAPHS
Wetland Delineation
Port Arthur LNG, LLC
Jefferson County, Texas

PHOTOGRAPH 1 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 101.

PHOTOGRAPH 2 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 101.

PHOTOGRAPH 3 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 102.

PHOTOGRAPH 4 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 102.

PHOTOGRAPH 5 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 103.

PHOTOGRAPH 6 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 103.

PHOTOGRAPH 7 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 104.

PHOTOGRAPH 8 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 104.

PHOTOGRAPH 9 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 105.

PHOTOGRAPH 10 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 105.

PHOTOGRAPH 11 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 106.

PHOTOGRAPH 12 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 107.

PHOTOGRAPH 13 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 107.

PHOTOGRAPH 14 (TBS PHOTO 12 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 108.

PHOTOGRAPH 15 (TBS PHOTO 12 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 108.

PHOTOGRAPH 16 (TBS PHOTO 13 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 109.

PHOTOGRAPH 17 (TBS PHOTO 13 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 109.

PHOTOGRAPH 18 (TBS PHOTO 13 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 110.

PHOTOGRAPH 19 (TBS PHOTO 13 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 110.

PHOTOGRAPH 20 (TBS PHOTO 13 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 111.

PHOTOGRAPH 21 (TBS PHOTO 13 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 111.

PHOTOGRAPH 22 (TBS PHOTO 13 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 112.

PHOTOGRAPH 23 (TBS PHOTO 13 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 112.

PHOTOGRAPH 24 (TBS PHOTO 13 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 113.

PHOTOGRAPH 25 (TBS PHOTO 13 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 113.

PHOTOGRAPH 26 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 114.

PHOTOGRAPH 27 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 114.

PHOTOGRAPH 28 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 115.

PHOTOGRAPH 29 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 115.

PHOTOGRAPH 30 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 116.

PHOTOGRAPH 31 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 116.

PHOTOGRAPH 32 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 117.

PHOTOGRAPH 33 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 117.

PHOTOGRAPH 34 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 118.

PHOTOGRAPH 35 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 118.

PHOTOGRAPH 36 (TBS PHOTO 14 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 119.

PHOTOGRAPH 37 (TBS PHOTO 14 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 119.

PHOTOGRAPH 38 (TBS PHOTO 15 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 120.

PHOTOGRAPH 39 (TBS PHOTO 15 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 120.

PHOTOGRAPH 40 (TBS PHOTO 15 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 121.

PHOTOGRAPH 41 (TBS PHOTO 15 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 121.

PHOTOGRAPH 42 (TBS PHOTO 15 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 122.

PHOTOGRAPH 43 (TBS PHOTO 15 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 122.

PHOTOGRAPH 44 (TBS PHOTO 20 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 202.

PHOTOGRAPH 45 (TBS PHOTO 20 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 202.

PHOTOGRAPH 46 (TBS PHOTO 20 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 203.

PHOTOGRAPH 47 (TBS PHOTO 20 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 203.

PHOTOGRAPH 48 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 204.

PHOTOGRAPH 49 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 204.

PHOTOGRAPH 50 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 205.

PHOTOGRAPH 51 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 205.

PHOTOGRAPH 52 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 206.

PHOTOGRAPH 53 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 206.

PHOTOGRAPH 54 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 207.

PHOTOGRAPH 55 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 207.

PHOTOGRAPH 56 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 208.

PHOTOGRAPH 57 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 208.

PHOTOGRAPH 58 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 209.

PHOTOGRAPH 59 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 209.

PHOTOGRAPH 60 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 210.

PHOTOGRAPH 61 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 210.

PHOTOGRAPH 62 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 211.

PHOTOGRAPH 63 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 211.

PHOTOGRAPH 64 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 212.

PHOTOGRAPH 65 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 212.

PHOTOGRAPH 66 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 213.

PHOTOGRAPH 67 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 213.

PHOTOGRAPH 68 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 214.

PHOTOGRAPH 69 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 214.

PHOTOGRAPH 70 (TBS PHOTO 21 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 215.

PHOTOGRAPH 71 (TBS PHOTO 21 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 215.

PHOTOGRAPH 72 (TBS PHOTO 22 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 216.

PHOTOGRAPH 73 (TBS PHOTO 22 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 216.

PHOTOGRAPH 74 (TBS PHOTO 22 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 217.

PHOTOGRAPH 75 (TBS PHOTO 22 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 217.

PHOTOGRAPH 76 (TBS PHOTO 22 AUG 2014) VIEW OF SOIL SAMPLE FROM SAMPLING POINT 218.

PHOTOGRAPH 77 (TBS PHOTO 22 AUG 2014) VIEW OF AREA SURROUNDING SAMPLING POINT 218.